

DTIC FILE COPY

AD-A216 585



**US Army Corps
of Engineers**
Kansas City District

Harry S. Truman Dam and Reservoir, Missouri

2

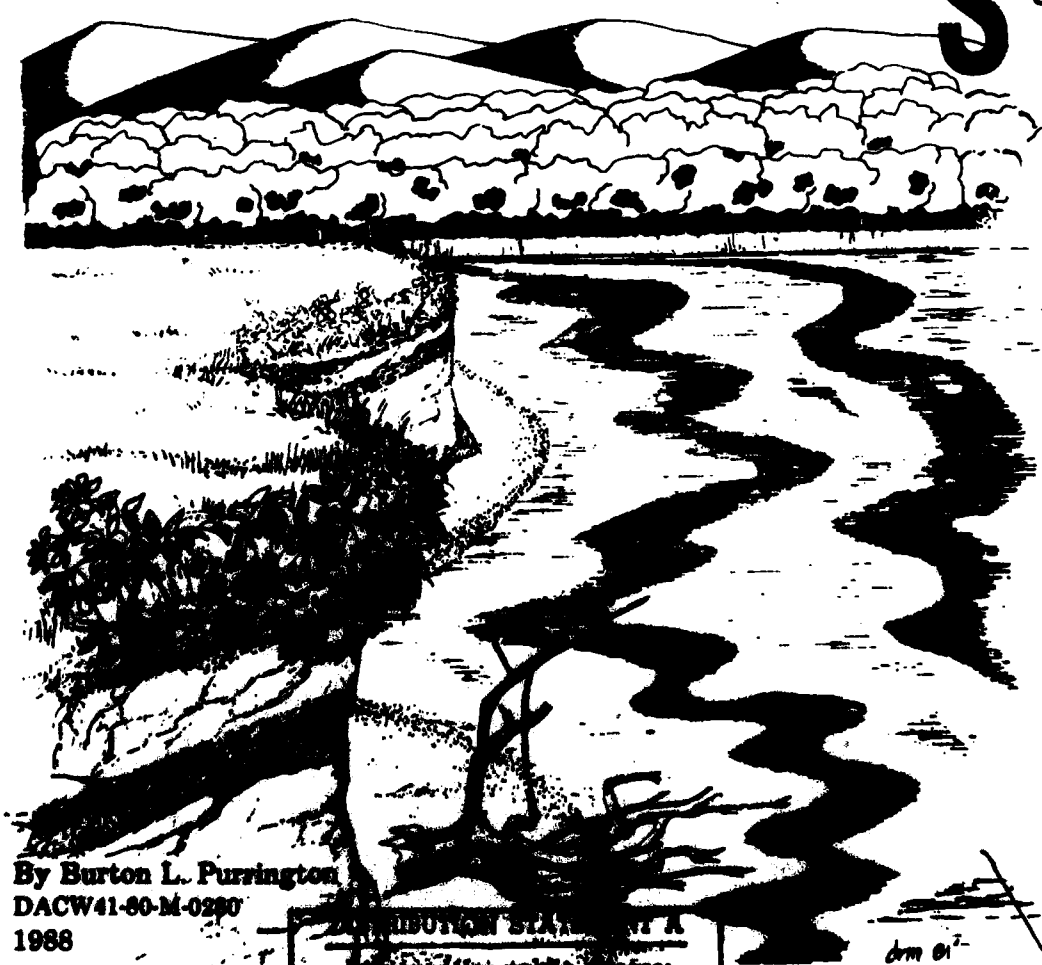
Center for Archaeological Research
Southwest Missouri State University
Springfield, Missouri

An Archaeological Reconnaissance of Proposed Levees, Water-Oriented Recreation Facilities and Borrow Areas Downstream from the Harry S. Truman Dam and Reservoir, Benton County, Missouri: 1980

Project: CAR:310

DTIC
ELECTE
JAN 08 1990
S E D

90 01 08 069



By Burton L. Purrington
DACW41-80-M-0230
1988

Approved for public release;
Distribution Unlimited

AN ARCHAEOLOGICAL RECONNAISSANCE OF PROPOSED
LEVEES, WATER-ORIENTED RECREATION FACILITIES
AND BORROW AREAS DOWNSTREAM FROM THE
HARRY S. TRUMAN DAM AND RESERVOIR,
BENTON COUNTY, MISSOURI: 1980

PROJECT: CAR-310

Prepared by

Burton L. Purrington (Principal Investigator)
Research Archaeologist

Final Report

An Archaeological Investigation
Prepared for
U.S. Army Corps of Engineers
Kansas City District

Contract No. DACW41-80-M-0280

by

Center for Archaeological Research
Dr. Burton L. Purrington, Acting Director
Southwest Missouri State University
Springfield, Missouri 65802

1988

Funds for this investigation and report were provided by the U.S. Army Corps of Engineers. The Corps may not necessarily agree with the contents of this report in its entirety. The report reflects the professional views of the contractor who is responsible for collection of the data, analysis, conclusions and recommendations.



Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input checked="" type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By _____	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE				Form Approved OMB No. 0704-0188	
1a. REPORT SECURITY CLASSIFICATION <u>unclassified</u>			1b. RESTRICTIVE MARKINGS		
2a. SECURITY CLASSIFICATION AUTHORITY			3. DISTRIBUTION / AVAILABILITY OF REPORT Approved for public release; distribution unlimited		
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE					
4. PERFORMING ORGANIZATION REPORT NUMBER(S)			5. MONITORING ORGANIZATION REPORT NUMBER(S)		
6a. NAME OF PERFORMING ORGANIZATION Center for Archaeological Research		6b. OFFICE SYMBOL (If applicable)	7a. NAME OF MONITORING ORGANIZATION		
6c. ADDRESS (City, State, and ZIP Code) Southwest Missouri State University Springfield, Missouri 65802			7b. ADDRESS (City, State, and ZIP Code)		
8a. NAME OF FUNDING / SPONSORING ORGANIZATION US Army Engineering District		8b. OFFICE SYMBOL (If applicable) CEMRKPD-R	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER DACW41-80-M-0280		
8c. ADDRESS (City, State, and ZIP Code) 700 Federal Building, 601 East 12th Street Kansas City, Missouri 64106-2896			10. SOURCE OF FUNDING NUMBERS		
			PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.
					WORK UNIT ACCESSION NO.
11. TITLE (Include Security Classification) An Archaeological Reconnaissance of Proposed Levees, Water-Oriented Recreation Facilities and Borrow Areas Downstream from the Harry S. Truman Dam and Reservoir, Benton County, Mo. 1980					
12. PERSONAL AUTHOR(S) Burton L. Purrington					
13a. TYPE OF REPORT Final Report		13b. TIME COVERED FROM 1980 TO 1981		14. DATE OF REPORT (Year, Month, Day) 1988	
15. PAGE COUNT 111					
16. SUPPLEMENTARY NOTATION					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP	Lotterer site levee Gaylord Pasture site		
			reconnaissance Ozark Highland Kowertz site		
			construction Osage River Barry site		
19. ABSTRACT (Continue on reverse if necessary and identify by block number) Reconnaissance was conducted in areas to be impacted by levee construction and the relocation of recreation facilities downstream of the Harry S. Truman Dam and Reservoir. The survey was conducted on the western edge of the Ozark Highland at the border of the Springfield and Salem plateaus; in the Lake of the Ozarks watershed, Osage River principal drainage basin; and the Missouri River major drainage basin. Four archaeological sites: the Gaylord Pasture Site, the Kowertz site, the Barry site, and the Lotterer Site were located and recorded by the reconnaissance. Three of the sites contained materials from the Middle to late Woodland periods. One site had no cultural affiliations. Reported American Indians artifacts. (EDC) A					
20. DISTRIBUTION / AVAILABILITY OF ABSTRACT <input type="checkbox"/> UNCLASSIFIED/UNLIMITED <input checked="" type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION Unclassified		
22a. NAME OF RESPONSIBLE INDIVIDUAL Planning Division, Environmental Res. Br.			22b. TELEPHONE (Include Area Code) (816) 426-3402		22c. OFFICE SYMBOL CEMRKPD-R

18. Late Woodland
Middle Woodland
Harry S. Truman Dam and Reservoir

TABLE OF CONTENTS

	Page
ABSTRACT	7
INTRODUCTION	9
CHAPTER	
I. PROJECT LOCATION AND DESCRIPTION	13
II. SCOPE OF WORK AND GOALS OF THE SURVEY	19
III. NATURAL ENVIRONMENT	21
Regional	21
Local Environmental Setting of the Project/ Survey Areas	23
IV. PREVIOUS ARCHAEOLOGICAL RESEARCH	25
V. PREHISTORIC CULTURAL SEQUENCE	27
Pre-Paleo-Indian (prior to 12,000 B.P.)	27
Paleo-Indian (12,000-10,500 B.P.)	27
Dalton (10,500-9500 B.P.)	27
Early Archaic (9500-8100 B.P.)	28
Middle Archaic (8100-4000 B.P.)	28
Late Archaic (4000-2000 B.P.)	29
Woodland (2000-1000 B.P.)	30
Mississippian (1000-300 B.P.)	31
VI. HISTORICAL BACKGROUND	33
VII. LITERATURE REVIEW AND RECORDS CHECK	37
VIII. RESEARCH DESIGN	39
Cultural Resource Management Considerations	39
Archaeological Research Questions	40
Project-Specific Research Design.	40
IX. THE FIELD RECONNAISSANCE	43
Description of the Project Area and Conditions	
Affecting the Survey	43
Survey Methods	47
Results of the Reconnaissance	49

CHAPTER	Page
X. DESCRIPTION OF ARCHAEOLOGICAL SITES	51
The Gaylord Pasture Site, 23BE1007	51
The Kowertz Site, 23BE1008	52
The Barry Site, 23BE1009	53
The Lotterer Site, 23BE1010	54
XI. ARTIFACT DESCRIPTION	57
Projectile Point/Knife	57
Hafted Knife	59
Generalized Biface	59
Thin and Indeterminate Biface Fragments	61
Denticulate	61
Thick, Steeply Beveled End Scraper	61
Irregular Scrapers	65
Utilized Flake Scrapers	65
Spokeshave Scraper	65
Chopper	65
Perforator, Reworked PP/K	65
Perforator, Unprepared Flake	65
Polished Biface (Digging Tool?)	65
Combination Tools	66
Tested Cobble	66
Core	66
Exhausted Core	66
Blade Core	66
Flakes	66
Angular Fragments	68
Mano	68
Pestle	68
Anvil	68
Shaped Cobble Fragment	68
Rubbed Hematite	71
Fossils	71
Prehistoric Ceramics	71
Historic Ceramics	71
Thermally Fractured Rock	71
XII. CULTURAL-TEMPORAL AFFILIATION OF SITES	73
XIII. SITE FUNCTION	75
Interpretation of Site Function	75
Site Activities and Function	81
Role of the Sites in Local Adaptive Systems	84
XIV. LOCAL AND REGIONAL CULTURAL CONTEXTS	85
XV. ASSESSMENT OF SITE SIGNIFICANCE	87
Criteria of Significance and Assessment of Sites	87
Research Potential of the Sites	88

CHAPTER	Page
XVI. ASSESSMENT OF PROJECT IMPACT.	89
XVII. AN ESTIMATE OF THE ARCHAEOLOGICAL RESOURCE BASE OF THE BELOW TRUMAN PROJECT AREA . . .	91
XVIII. RECOMMANDATIONS	93
REFERENCES CITED	95
APPENICES	
I. INVENTORY OF DESCRIPTIVE/USE CATEGORIES OF ARTIFACTS FROM 1980 BELOW TRUMAN RECONNAISSANCE103
II. EXCAVATED ARCHAEOLOGICAL MATERIAL FROM 23BE1010107
III. TYPES OF FLAKES UTILIZED AND RETOUCED AS SCRAPERS.108
IV. GLOSSARY109

FIGURES

1. Proposed project area and Truman Reservoir in relation to archaeological-physiographic regions of Missouri	14
2. Project area in relation to hydrological units in Missouri	15
3. Below Truman Dam project/survey areas and topography of project area	17
4. Physiographic provinces of project area	22
5. Project/survey areas showing surface visibility and shovel test locations	45
6. Projectile point/knives from Lotterer site, 23BE1010	58
7. Hafted bifacial tools	60
8. Bifaces from the Lotterer site, 23BE1010	62
9. Aborted preforms and denticulate from Lotterer site, 23BE1010	63
10. Digging tool and thick, steeply beveled end scrapers from the Lotterer site, 23BE1010	64
11. Blade core, blade flake, and rubbed hematite from Lotterer site, 23BE1010	67
12. Mano from the Lotterer site, 23BE1010	69
13. Unshaped pestle from Lotterer site, 23BE1010	70

TABLES

1. Inferred uses of prehistoric artifacts from the Missouri Ozarks	76
2. Sets of artifacts and cultural features evidencing particular activity sets in the Missouri Ozarks	79
3. Artifact use classes and activity indices by site	82

AN ARCHAEOLOGICAL RECONNAISSANCE OF PROPOSED LEVEES,
WATER-ORIENTED RECREATION FACILITIES, AND BORROW
AREAS DOWNSTREAM FROM THE HARRY S. TRUMAN DAM
AND RESERVOIR, BENTON COUNTY, MISSOURI: 1980.

PROJECT: CAR-310

ABSTRACT

An on-site, pedestrian archaeological reconnaissance was conducted for the U.S. Army Corps of Engineers, Kansas City District, in areas to be impacted by levee construction and relocation of water-oriented recreation facilities immediately downstream from the Harry S. Truman Dam and Reservoir. The survey was conducted to obtain preliminary predictive data on the distribution and nature of archaeological sites, to provide a general impression of the significance of the sites, and to assess the probable impact of future plans on the sites.

The project area is located on the western edge of the Ozark Highland at the border of the Springfield and Salem plateaus and in the Lake of the Ozarks watershed, Osage River principal drainage basin, and the Missouri River major drainage basin. The project's direct impact areas are on the floodplain and terraces of the Osage River.

Four archaeological sites were located and recorded by the reconnaissance. The Gaylord pasture site, 23BE1007, is a low density, limited activity site of undetermined cultural affiliation on an older terrace. The Kowertz site, 23BE1008, is a low-to-moderate density, limited activity, possibly Late Woodland site with a buried cultural horizon on the floodplain adjacent to the Osage River. The Barry site, 23BE1009, is a moderate-to-high density, limited activity site with Middle Woodland cultural material on an older terrace. The Lotterer site, 23BE1010, is a high density, multiple activity Middle to Late Woodland site with a buried midden on the floodplain adjacent to the Osage River.

The project as planned will cause severe disturbances at all four sites. The Barry site has been so severely disturbed that it is assessed as ineligible for inclusion in the National Register of Historic Places. The remaining three sites are assessed as potentially eligible for the National Register pending further field investigation and analysis. It is recommended that the project avoid the three potentially significant sites or that test excavations to determine site significance and the effect of the project be conducted at any sites which cannot be avoided. Should any or all of these sites be determined to be eligible for the National Register, avoidance, preservation, or mitigation through data recovery is strongly recommended. It is further recommended that intensive subsurface testing to locate possibly buried sites be conducted in two project tracts where surface visibility was poor at the time of the survey. Finally, it is recommended that the project be issued clearance to proceed as planned in the remaining areas where no significant or potentially significant sites were found with the condition that construction be temporarily halted if buried archaeological remains are exposed until their significance can be determined and any necessary mitigative steps can be taken.

CENTER FOR ARCHAEOLOGICAL RESEARCH
Burton L. Purrington
Principal Investigator

AN ARCHAEOLOGICAL RECONNAISSANCE OF PROPOSED LEVEES,
WATER-ORIENTED RECREATION FACILITIES, AND BORROW
AREAS DOWNSTREAM FROM THE HARRY S. TRUMAN DAM
AND RESERVOIR, BENTON COUNTY, MISSOURI: 1980.

PROJECT: CAR-310

INTRODUCTION

This report presents the results of an on-site, pedestrian archaeological reconnaissance conducted for the U.S. Army Corps of Engineers, Kansas City District, in areas totaling about 500 acres which are immediately downstream from the Harry S. Truman Dam and Reservoir in Benton County, Missouri. The project/survey areas are to be impacted by proposed levee construction and relocation of water-oriented recreation facilities and they include proposed construction and borrow areas. The survey was carried out by the Center for Archaeological Research, Southwest Missouri State University, Springfield, Missouri, under contract number DACW41-M-0280 with the U.S. Army Corps of Engineers, Kansas City District.

The survey was conducted to obtain preliminary, predictive data on the distribution and nature of archaeological sites, to provide a general impression of the significance of the sites, and to assess the probable impact of future plans on the sites located downstream of the reservoir. The survey consisted of two parts. The first included a records check, literature review, and consultation with other archaeologists working in the general project area in order to identify any previously recorded archaeological sites which might be in the project/survey areas. This review provided environmental, cultural-historical, methodological, and theoretical contexts within which a research design could be developed and any archaeological sites located might be assessed in terms of potential significance and anticipated impacts of proposed and future development. The second part included a field reconnaissance consisting of an on-site, pedestrian archaeological reconnaissance of the entire project area.

With the exception of consultants all participants in this project were members of the staff of the Center for Archaeological Research, Southwest Missouri State University. The field work was conducted on January 5, 1980, by Burton L. Purrington, Principal Investigator and Research Archaeologist; on January 7-11, 1980, by Joetta K. Davis-Smith, Barbara L. Fischer, and Rike Reuter-Hart, Research Technicians; and on July 31, 1980, by Purrington. The processing and preliminary sorting of materials recovered by the reconnaissance were done by Patsy Corbett, Laboratory Director, and Purrington analyzed and classified the cultural material. The maps were drafted by David Massey and Lee Douthit and the artifact illustrations were done by Janis Chester. Mildred Wilcox edited the report, and it was typed by Deborah McGath.

Staff of the American Archaeology Division, University of Missouri-Columbia, who were completing a multi-volume draft report on survey and testing in the Truman Reservoir were consulted, including Dr. Donna C. Roper, who served as a consultant and Michael Reagan and Susan Goldberg, who answered questions regarding artifact classification. Staff archaeologists with the U.S. Army Corps of Engineers, Kansas City District, provided background information on the project.

I wish to gratefully acknowledge the customary fine contributions of the Staff of the Center for Archaeological Research. I am also very grateful

to those consulted for graciously taking time from their busy schedules to offer extremely useful insights and information and to the Corps of Engineers for their support of this project. Needless to say, any errors of fact, interpretation, or omission in this report are the responsibility of the author.

All cultural materials recovered during the field survey, as itemized in Appendix II, are curated by the Center for Archaeological Research. All field and laboratory records are on file at the same institution.

This survey was conducted in compliance with federal legislation designed to protect significant cultural resources. The applicable laws are summarized below:

The National Historic Preservation Act of 1966 (80 Sta. 915) declares a national policy of historic preservation defined in the Act as "the protection, rehabilitation, restoration, and reconstruction of districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, or culture," including the encouragement of preservation on the State and private levels; directs the expansion of the National Register of Historic Places to include cultural resources of State and local as well as national significance; authorizes matching Federal grants to States and the National Trust for Historic Preservation for acquisition and rehabilitation of National Register properties; establishes an Advisory Council on Historic Preservation; provides procedures in Section 106 for Federal agencies to follow in the event a proposal may affect a property on, or eligible to, the National Register.

National Environmental Policy Act of 1969 declares that it is the policy of the Federal Government "to preserve important historic, cultural, and natural aspects of our national heritage;" the National Environmental Policy Act (NEPA) directs that, "to the fullest extent possible . . . the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act." Compliance with NEPA, therefore, includes a demonstration of compliance during project planning and execution with other measures for the protection of environmental values.

Executive Order 11593 Protection and Enhancement of the Cultural Environment, May 13, 1971 (36 F.R. 8921), in furtherance of the purposes and policies of NEPA, the National Historic Preservation Act, the Historic Sites Act, and the Antiquities Act, asserts that the "Federal Government shall provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the Nation;" directs Federal agencies to ensure the preservation of cultural resources in Federal ownership and institute procedures to ensure that Federal plans and programs contribute to the preservation and enhancement of nonfederally-owned sites, structures, and objects of historic, architectural, or archeological significance; orders Federal agencies to locate, inventory, and nominate to the National Register all properties under their control or jurisdiction that meet the criteria for nomination; directs them to exercise caution during the interim period to ensure that cultural resources under their control are not inadvertently damaged, destroyed, or transferred before the completion of inventories and evaluation of properties worthy of nomination to the National Register; and orders the Secretary of the Interior to undertake certain advisory responsibilities in compliance with the order.

The Archeological and Historical Conservation Act of 1974 (88 Stat. 174) amends the Reservoir Salvage Act of 1960 to extend provisions for the protection of historical and archeological data at dams to include any alteration of the terrain caused as a result of any Federal construction project or federally licensed activity or program.

CHAPTER I

Project Location and Description

The project/survey areas are located in the main valley of the Osage River at the headwaters of Lake of the Ozarks and immediately downstream from the Harry S. Truman Dam and Reservoir, T40N, R22W, Benton County, Missouri (Figure 1). These areas are in or near the city of Warsaw, Missouri.

Following the Missouri Department of Natural Resources' system of drainage basins as archaeological research units (Weichman n.d.), the project area falls in the Lake of the Ozarks watershed, Osage River principal drainage basin, and Missouri River major drainage basin (Figure 2). Geographically and to some extent culturally related watersheds include the upper and lower Osage, Pomme de Terre, and Sac. The project area falls on the border of two physiographic subdivisions, the Springfield and Salem plateaus, which are both included in the Ozark Plateau physiographic province (Bretz 1965). Chapman (1975:3-4) includes the two physiographic subdivisions in separate archaeological-physiographic regions; the Springfield Plateau portion of the project area is in the Upper Osage locality of the Western Prairie region and the Salem Plateau portion of the project area is in the Lower Osage locality of the Ozark Highland region (Figure 1).

The U.S. Army Corps of Engineers proposes to construct a 2.6-mile-long levee to protect approximately 380 acres of land from periodic inundation due to power releases from the Harry S. Truman Dam. The levee would be located immediately downstream from the Truman Dam outlet channel and across the Osage River from Warsaw, the county seat of Benton County (Figure 3). The Corps also proposes to relocate the present water-oriented recreation facilities at Warsaw and to use selected areas downstream from the dam for borrow in the levee construction (Figure 3). The total project/survey area, which consists of 8 separate units (Figure 3), includes about 500 acres.

The potential direct impacts of the proposed project on archaeological resources include burial and possible disturbance of sites by levee construction, disturbance of archaeological resources by construction related to relocation of water-oriented recreation facilities, and excavation of fill from borrow areas. Indirect impacts would include potential disturbance of archaeological resources due to increased urban development and agricultural and recreational use of the project/survey area following improved flood control.

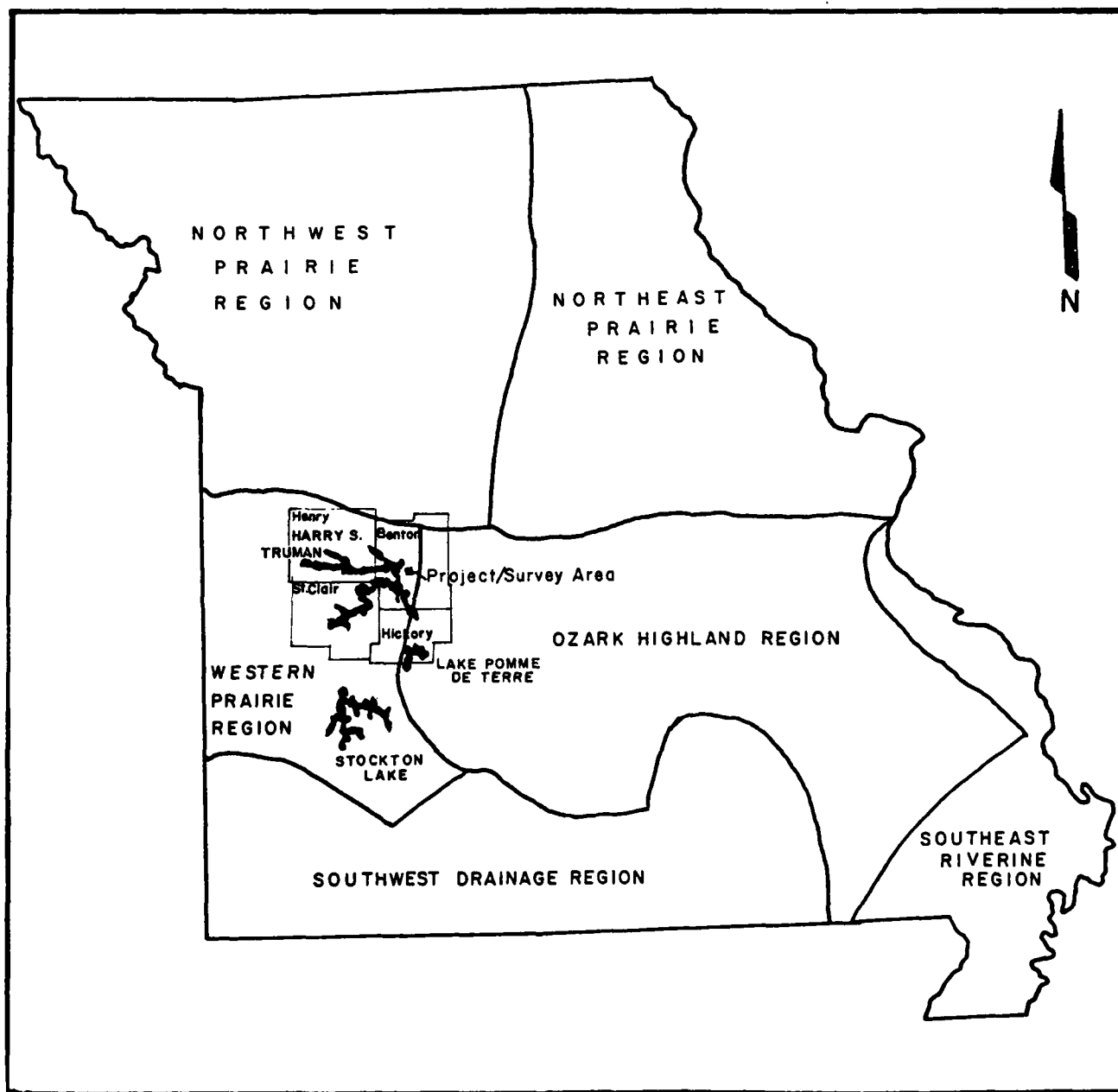


Figure 1. Proposed project area and Truman Reservoir in relation to archaeological-physiographic regions of Missouri (after Roper 1977:Figure 2).

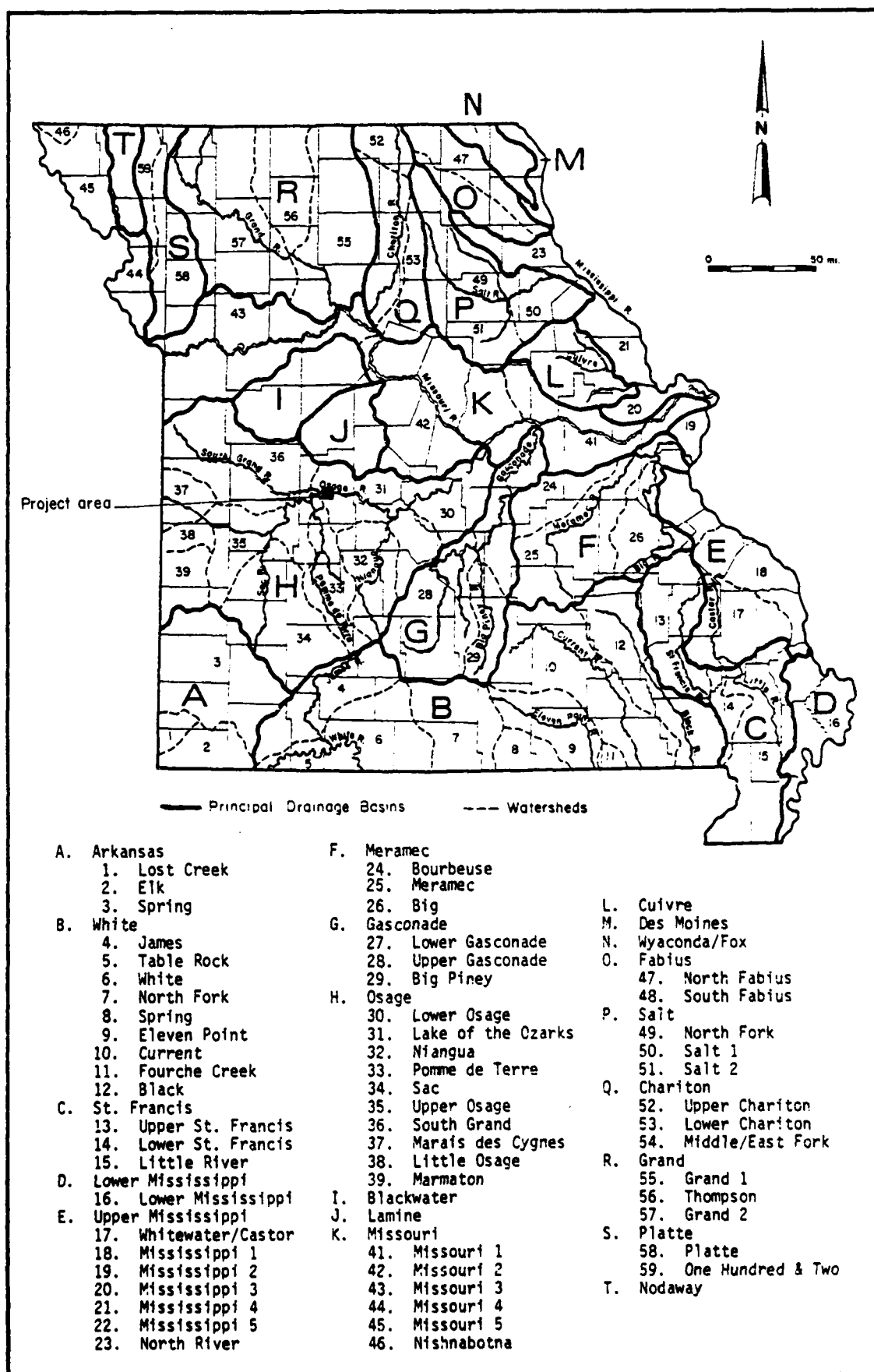


Figure 2. Project area in relation to hydrological units in Missouri.

LEVEE EXTENDS 330' TO THE NORTH (see inset)

RECONSTRUCTION OF WATER ORIENTED RECREATION FACILITIES AT CITY PARK

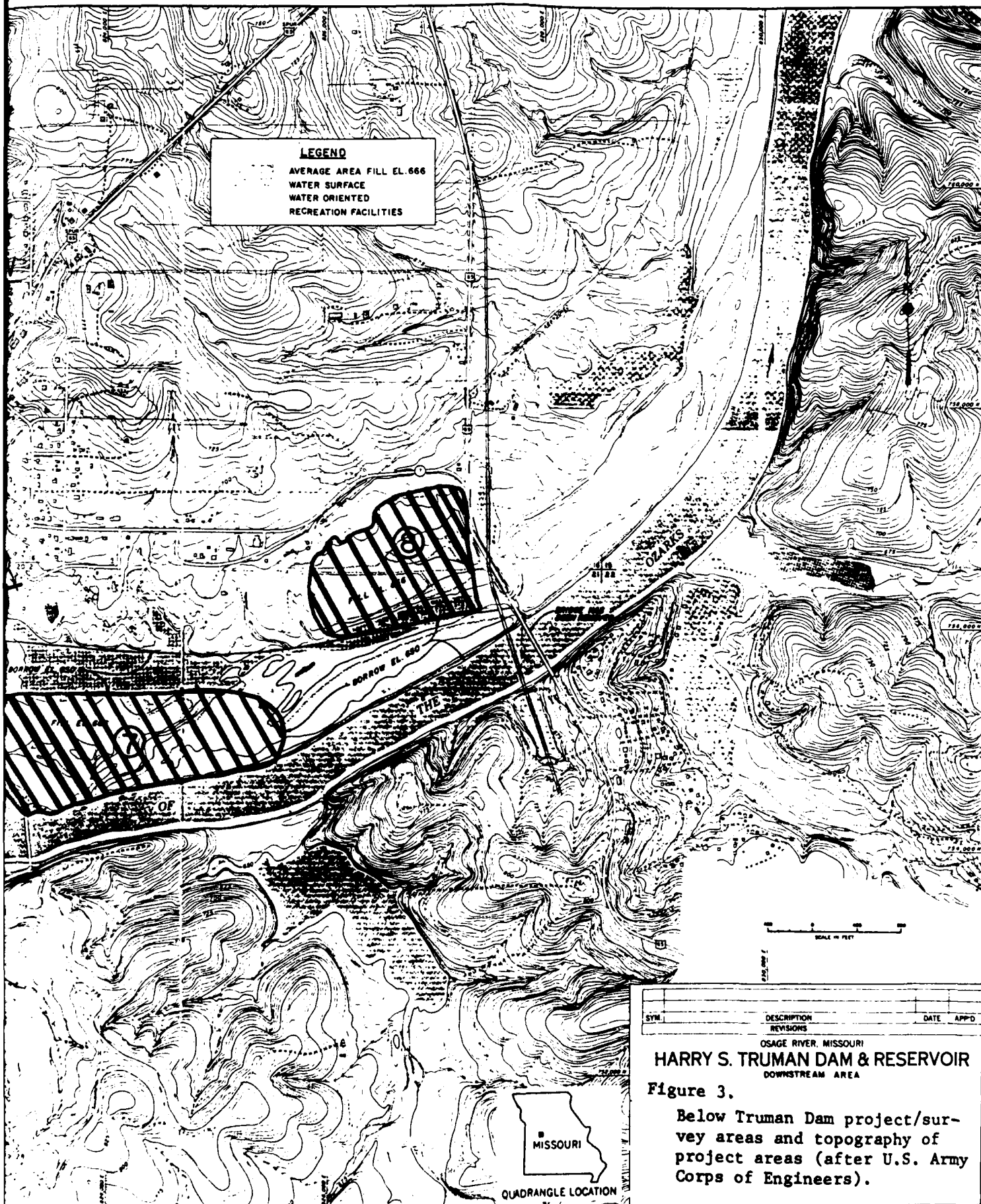
WARSAW

BORNHAY F. BRIDGE

Circled numbers indicate Project/Survey Tracts

①

**Circled numbers indicate
Project/Survey Tracts**



OSAGE RIVER, MISSOURI
HARRY S. TRUMAN DAM & RESERVOIR
DOWNSTREAM AREA

Figure 3.

Below Truman Dam project/survey areas and topography of project areas (after U.S. Army Corps of Engineers).

CHAPTER II

Scope of Work and Goals of the Survey

The project scope of work calls for:

an on-the-ground surface examination of the reconnaissance area to obtain preliminary, predictive data on the distribution and nature of archaeological sites, to provide a general impression of the value of the sites, and the probable impact of future plans on the sites.

Key points in the study approach called for in the scope of work include: 1) a literature review and records check prior to the development of a research design; 2) the development of a research design; 3) a 100 percent reconnaissance of the project area consisting of units 1 - 8 as shown in Figure 3; 4) collection, when possible, of a sample of surface cultural materials at each site; 5) coordination of field work and findings with those of archaeologists who have worked or are working in the Harry S. Truman reservoir area; 6) determination of which new sites require further testing in order to assess eligibility for inclusion in the National Register of Historic Places and "indicate relative significance for ranking priorities in accomplishing recommended work," and 7) preparation of a plan of intensive survey of the project area including predictive models of location of cultural resources.

CHAPTER III

Natural Environment

Regional

Detailed discussions of past and present environmental characteristics of the Harry S. Truman reservoir area are provided in Wood and McMillan's Prehistoric Man and His Environments (1976), including studies by McMillan (1976a), Haynes (1976), King and Lindsay (1976), and Ahler (1976). The environmental setting of the general project area is also described in draft reports to the Corps of Engineers (e.g. Roper 1977a:11-12; 1977b:6-18; Ward et al. 1977; Iroquois Research Institute 1980:5-23).

The Truman Reservoir is located on a major ecotone between the Ozark Highland and the Western Prairie archaeological-physiographic regions of Missouri (Figures 1 and 4; cf. Chapman 1975:1-19). As Roper (1977a:11-13) notes, the Ozark Highland region roughly corresponds to the Salem Plateau of Bretz (1965:11) and is characterized by deeply incised streams with steep relief along narrow valley walls, and tightly meandering streams. Oak-hickory forests with prairie openings in some upland areas were the dominant vegetation. The Western Prairie region, in contrast, corresponds with Bretz's Springfield Plateau (Bretz 1965:12), and is characterized by broader river valleys and less deeply entrenched streams than the Ozark Highland region. Streams form less tortuously winding meander patterns, and relief along valley walls is more rolling and gentle.

The contact between these two regions is at the Eureka Springs Escarpment, a feature which marks the contact between the Mississippian age bedrock in the Springfield Plateau on the west, and the Ordovician bedrock with scattered monadnocks (erosional remnants) of Mississippian age in the Salem Plateau on the east (Bretz 1965:13-14). A third major physiographic area in the Truman Reservoir area is the Osage Plains in the western-most part of the reservoir (Figure 4; cf. Iroquois Research Institute 1980:5-17). The Osage Plains also fall in the Western Prairie region. The broader river bottoms of the Western Prairie region probably offered a superior agricultural potential to that of the Ozark Plateau, and Roper (1978:10) has noted that the region's major non-Euro-American farmers, the Osage, located their villages upstream from the Truman Reservoir in relatively broad expanses of bottomland.

Prior to modern plow agriculture the native vegetation of the Western Prairie region was tallgrass prairie with oak-hickory gallery forests along the streams and valley walls. Oak-hickory forests, which included a diversity of predominantly deciduous tree species, dominated the western Ozark Highland although prairie openings occurred in many upland areas (McMillan 1976a:26). The transition between the floral communities of these two regions is gradual and follows a northeast-southwest trend across the study area (Joyer and Roper n.d.:3). The climatic-vegetational border between the regions fluctuated dramatically in the past (J. King and Lindsay 1976; F. King 1978).

The climate of the general project area is temperate, humid, and continental. Summers are warm and, despite the fact that June tends to be the rainiest month of the year (an average of 11.9 cm or 4.7 in. from 1951 to 1974 at Appleton City, Missouri--U.S. Department of Commerce 1978), long periods of drouth are common. Summer thunderstorms are frequent and

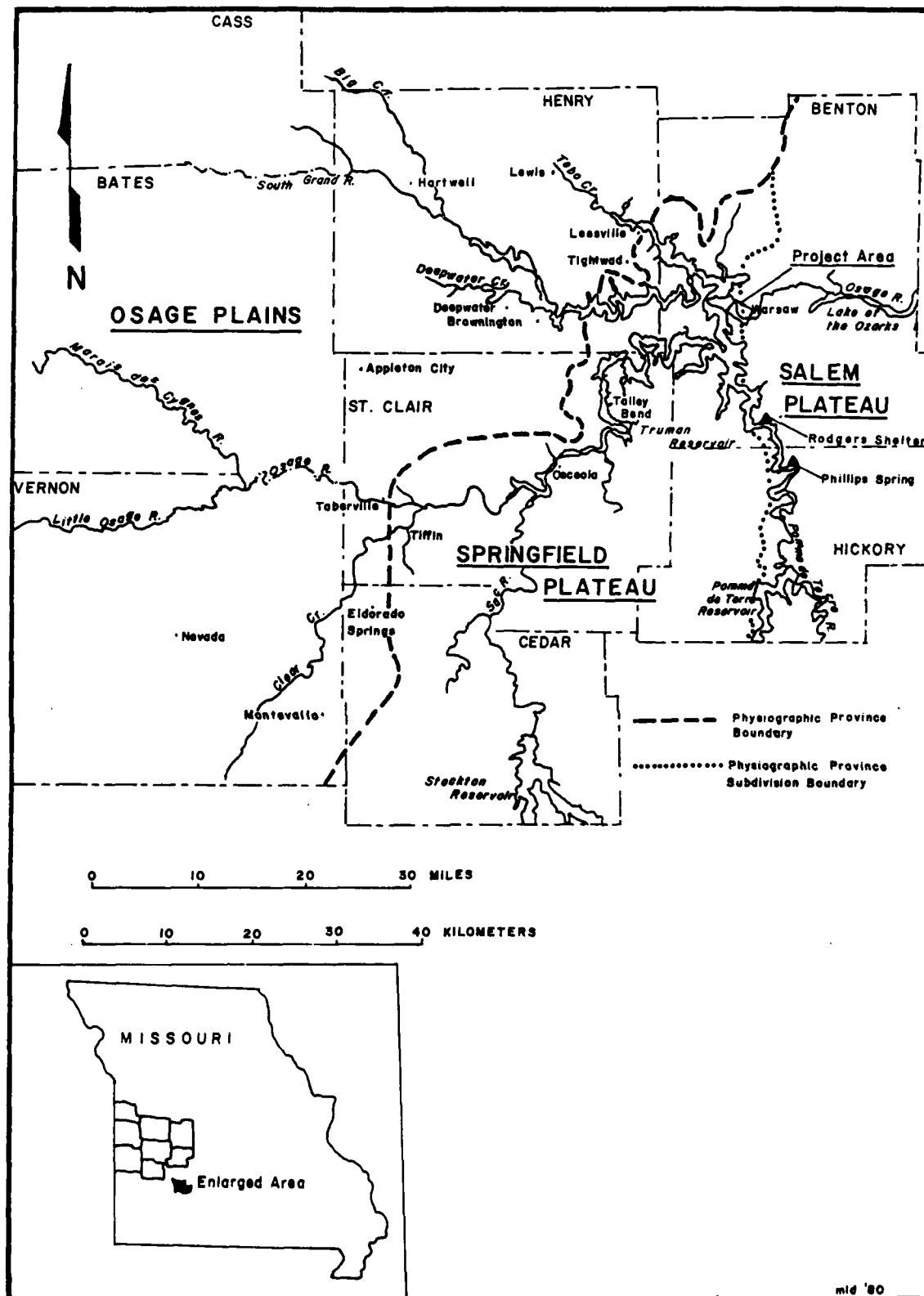


Figure 4. Physiographic provinces of project area (after Iroquois Research Institute 1980:Plate 3)

occasionally tornadoes occur. July and August are the hottest months of the year with an average daily high of 33°C (91°F) at Appleton City.

Winters are relatively short and mild, but periods of continuous sub-freezing temperatures and snow cover lasting several weeks have been experienced in recent years. January tends to be the coldest (5.5°C or 42°F) and driest (3.6 cm or 1.4 in.) month of the year. Spring and autumn weather is highly variable. The Osage Plains portion of the general project area is somewhat drier (mean annual precipitation is 100 cm or 39.4 in.) than the adjacent Ozark Plateaus (mean annual precipitation is 102 cm or 40.2 in.) and in the latter region winds are more subdued and variable and microclimates and microenvironments are more varied (Iroquois Research Institute 1980:16).

The environmental setting of any specific site or locality has not been a constant throughout the past. As Joyer and Roper (n.d.:3-4) note, studies of faunal remains and sediments indicate a period of warming and drying beginning 8600 to 8200 years ago, peaking between 8000 and 7000 B.P. and continuing for several millennia. This fluctuation (the Hypsithermal) was probably characterized by a shift from an oak-hickory forest-edge environment to a greater percent of grassland prairie, with concomitant shifting of the prairie/forest border toward the east. After a peak that may have lasted for several millennia, the Hypsithermal gradually ended by about 4000 years ago with a return to a forest/prairie distribution similar to recent times (McMillan 1976b:228). The implications of the Hypsithermal for the distribution and diversity of potentially edible plants have been dramatically illustrated by F. King (1978:73-75), and show a drastically reduced edible plant food potential everywhere except within major bottomlands. Given environmental diversity and change, we might expect a corresponding diversity of the archaeological record, reflecting temporally and spatially changing conditions (Joyer and Roper n.d.:4).

Roper (1978) has argued that although the Osage River basin contained a wide diversity of resources, it was incapable of producing sufficient quantities of major economic resources to support anything beyond a small, stable population. Bottomlands are relatively narrow and lack the complexity of the Missouri River floodplain. The Osage River Valley is not on a major migratory waterfowl flyway, and projected yields of nuts and other economically important plant species in the Pomme de Terre valley appear to be 10 percent or less of what they were in the precontact Illinois River valley (Roper 1978:9; 1979:10; cf. F. King 1976:261-265; Zawacki and Hausfater 1969). It appears that prehistoric and early historic adaptive strategies and their sociocultural concomitants in the Ozarks would have been quite different from those of such regions of greater natural productivity as the Illinois and Tennessee river valleys.

Local Environmental Setting of the Project/Survey Areas

As noted above, the project survey areas lie on the border of the Western Prairie (Springfield Plateau) and Ozark Highland (Salem Plateau) regions. The upland terrain of the immediate area is rolling with moderately to steeply incised river and stream valleys.

The project/survey areas lie on the floodplain and terraces of the main valley of the Osage River (Figure 3). This is a relatively narrow section of the Osage Valley with bottomlands ranging from about 500 to 1100 meters in width. It lies just downstream from a tortuously meandering

section of the Osage River where the valleys are broader. The confluence of the Osage and Pomme de Terre rivers is about 14 river miles upstream or about 4.5 air miles to the southwest. The alluvial soils in the project area are of the Hartville-Ashton-Cedargap-Nolin association while local upland soils are of the Lebanon-Goss-Bardley-Peridge association (Allgood and Persinger 1979:34, 39). The respective topographic positions and elevations above the river of the floodplain and terrace landforms in the project area suggest that they may correspond respectively to the T-0 and T-1 terraces described by Haynes (1976; 1977). However, no geochronological, geomorphological, or pedological analyses were conducted to evaluate this preliminary interpretation since such investigations were beyond the scope of the project.

The local environment of the project/survey area has been radically altered by modern land-use practices. Much of the modern valley bottom is backswamp although this is at least in part a result of flooding and slow drainage caused by the raised water level of the Osage River due to the creation of the Lake of the Ozarks.

The modern environment of the study area is a mixture of river edge and backswamp forest, pasture, farmland and poorly drained fallow land. In pre-historic and early historic times the local environment was most likely a bottomland forest. McMillan (1976a:32) notes that "the floodplain supported the most diversified flora and series of microhabitats of any of the major plant communities defined." The most common trees were bur oak, black oak, chinquapin oak, hackberry, sycamore, black walnut, box elder, and several species of hickory, elm, and maple (McMillan 1976a:32-33). Important game animals preferring this habitat included opossum, eastern gray squirrel, black bear and raccoon while the bottomland forest was a secondary habitat for white-tailed deer and elk (McMillan 1976a:36-37). Fish, mussels, frogs, and turtles were additional resources readily available in this habitat and the over-flow ponds and sloughs of the expansive Osage River bottoms, especially near the mouth of the Pomme de Terre River (McMillan 1976a:38), served as an over-flow stopover for migratory waterfowl indigenous to the Mississippi Flyway to the east.

Even today a great deal of environmental variability is evident in the project area. A high percentage of land, relative to many neighboring localities in the Osage River floodplain, is low-lying. Such areas are subject to flooding and poor drainage and many contain standing water. Although they would have been generally uninviting as habitation loci in prehistoric times, they would have supported a rich variety of aquatic, semi-aquatic, and wetland plant and animal resources. A relatively small number of areas of high ground including terraces and high areas in the floodplain adjacent to the river (natural levees?) are present in the project area. Such locations could have served as intermittent, seasonal, or permanent habitation sites from which the variety of valley bottom habitats as well as the adjacent uplands could be exploited.

CHAPTER IV

Previous Archaeological Research

The Harry S. Truman Reservoir area has been one of the more intensively studied areas in the midwestern United States. Previous investigations in the area have been discussed in detail (Roper 1975; Iroquois Research Institute 1980:25-34) and will be summarized here. Antiquarian interest in the area began as early as the mid-nineteenth century with Koch's excavations of purported (now essentially refuted, cf. McMillan 1976c) associations of mastodon remains and human artifacts in springs along the Pomme de Terre River (Koch 1857). Between 1880 and the 1950s several bluff-top cairns and rockshelters were recorded, but only two, Vista shelter (23SR20) and Blackwell shelter (23HI172), were professionally investigated and reported (Wood 1961, 1968).

Archaeological interest became focused on the general project area with the planned construction of Pomme de Terre Reservoir, and extensive field work was conducted here during the 1950s (Chapman 1954; Wood 1961). The first of several surveys in the Truman Reservoir area (initially named the Kaysinger Bluff Reservoir) was conducted in 1959-1960 and resulted in the recording of 86 sites (Keller 1965). Over the next two decades more than 1400 sites were found and recorded in the reservoir area (Roper 1978: 2), and several were excavated, including Rodgers shelter (23BE125) (Wood and McMillan 1976; Kay 1978), several spring sites on the lower Pomme de Terre (Wood 1976; Chomko 1978; Kay 1978a), the Halleys Bluff (23VE2) and Coal Pit (23VE4) sites (Chapman 1965a, 1965b); and the Wolf Creek (23SR567) and Hand (23SR569) sites (Piontkowski 1977). Extensive, systematic archaeological surveys and limited test excavations have been conducted in the reservoir area since 1975 under the direction of Donna Roper and W. R. Wood and two multi-volume series of reports to the Corps of Engineers have been prepared or are in progress. Most recently a non-collection survey of a 15 percent sample of the 50-year flood easement lands associated with the reservoir was conducted by the Iroquois Research Institute (1980) for the Corps of Engineers, and a survey was conducted in the proposed Bledsoe Ferry Public Use Area immediately below the Truman Dam and above the project area by the University of Missouri-Columbia. Thirty-nine previously unrecorded archaeological sites were located by the former survey (Iroquois Research Institute 1980); none was located by the latter (Donna Roper, personal communication). During this general period archaeological surveys and excavations were also conducted in and below the nearby Stockton Reservoir on the Sac River (McMillan 1966; Calabrese et al. 1968; Ward 1968; Pangborn et al. 1968; Roper 1977b).

CHAPTER V

Prehistoric Cultural Sequence

Pre-Paleo-Indian (prior to 12,000 B.P.)

Evidence of human occupation of the New World prior to 12,000 B.P. is sparse and controversial. The best evidence for pre-Paleo-Indian presence in Missouri has been found at the Shriver site in Daviess County, about 125 miles north of the project area, in the Northwest Prairie region. Cultural remains were found stratigraphically below a Paleo-Indian zone at this site and thermoluminescence dates of about 15,000 B.P. were obtained from these lithic artifacts (Reagan et al. 1978). No evidence for this early period has been noted in or near the Truman Reservoir area.

Paleo-Indian (12,000-10,500 B.P.)

Diagnostic artifacts indicating probable Paleo-Indian presence in southwestern Missouri are fluted and/or parallel-flaked projectile point/knives (pp/k). Such artifacts have not been found in the Truman Reservoir (Roper 1977a:16, 164; Joyer and Roper n.d.:5) and Chapman's (1973) state-wide study of fluted point distribution in Missouri recorded only one such point in Benton County. Paleo-Indian remains were absent at the deeply stratified Rodgers shelter (McMillan 1976b:212-213).

The present evidence suggests that there was little or no human occupation of the project area during Paleo-Indian times. However, it is important to note that this period was one of extensive downcutting (Haynes 1976:59), and "Paleo-Indian remains, which may have been sparse to begin with, could have been removed soon after deposition or could presently be deeply buried at the base of Holocene alluvial sediments" (Joyer and Roper n.d.:6). The presence of mammoth and other large late Pleistocene fauna in spring deposits on the Pomme de Terre River (J. King and Lindsay 1976:73) suggests that the kinds of game animals hunted by Paleo-Indians to the west were probably available for human exploitation in the study area during the Paleo-Indian period, but thus far none of the purported associations of mastodon and human remains in the project area (Koch 1857) have been validated (McMillan 1976c).

Dalton (10,500-9500 B.P.)

Dalton culture is identified in the general study area by the presence of Dalton and Plainview pp/k (Roper 1977a:20). Chapman suggests that Dalton represents a transition from a hunting-based Paleo-Indian tradition to foraging Archaic cultures, and Dalton is classed as a "Hunter-Forager tradition" (Chapman 1975:96-97). The characterization of Paleo-Indians as specialized big game hunters has been questioned for many years and a more generalized economic base is certainly suggested in the floral and faunal assemblages in Paleo-Indian components at such sites as Shawnee-Minisink, Delaware (McNett, Marshall, and McDowell 1975) and Lewisville, Texas (Crook and Harris 1951). The best evidence for Dalton subsistence in the general project

area has been found at Rodgers shelter. Here Dalton people procured both large and small game as well as plant foods such as hickory nuts and black walnuts, and hunting, though "basic to the subsistence system, does not appear to have been as important as it was in the later horizons" (McMillan 1976b:224).

Dalton remains are relatively sparse in the project area and they are generally found close to water in relatively narrow segments of the bottomlands of major streams such as the Osage, South Grand, Sac, and Pomme de Terre rivers (Joyer and Roper n.d.:7-8). However, Dalton remains are found occasionally in the uplands and their scarcity in such settings may be due to erosion and redeposition rather than limited utilization (Roper, personal communication). This caveat may apply as well to the discussion of Early and Middle Archaic site distribution below.

Excavation of Dalton components at the Rodgers shelter and the Hand site in Truman Reservoir, as well as the Montgomery site (23CE261) on the Sac River below Stockton Reservoir (Collins, Danielsons, and Donohue 1977), have exposed several lithic concentrations, each about 10 meters or less in diameter and centered around an open fireplace. At Rodgers shelter these activity areas have been interpreted as transient settlements (rather than just overnight hunting stations) occupied for less than a week at a time by small, mobile bands (McMillan 1976b:223-224). The Dalton components at the Hand and Montgomery sites appear to represent similar activities (Joyer and Roper n.d.:7).

Early Archaic (9500-8100 B.P.)

Several pp/k styles, including Rice Lobed, Graham Cave Side Notched, Hidden Valley, Hardin, bifurcated base forms, and a small side-notched form, have been attributed to Early Archaic occupations in the Truman Reservoir (Roper 1977a:167; Joyer and Roper n.d.:8). Early Archaic components have been excavated at two sites in the Truman Reservoir, Rodgers shelter (Kay 1978a), and the Wolf Creek site (Piontkowski 1977). Early Archaic sites in the Truman Reservoir appear to be quite similar to the earlier Dalton sites in size and settlement patterns. However, a functional dichotomy, not evident in the Dalton sites, may be present in the Early Archaic sites. Joyer and Roper (n.d.:8-10) note that lanceolate pp/k, which are classed as multipurpose light-duty cutting implements (Ahler 1971:118), predominate at Rodgers shelter while the small bifurcate and side-notched forms, interpreted as true projectiles, predominate at open sites. At Rodgers shelter the Early Archaic occupation, which had been classified previously by McMillan (1976b:224-225) as Middle Archaic I, was much denser than Dalton and showed an emphasis on processing of plant materials and manufacturing and maintenance of tools (cf. Kay 1978b:19, 1978c:167; Joyer and Roper n.d.:9). Small game, particularly squirrels, was far more important than large game in the Early Archaic subsistence at Rodgers shelter (McMillan 1976b:224).

Middle Archaic (8100-4000 B.P.)

Several pp/k styles have been attributed by Chapman (1975) to the Middle Archaic but it has been noted that few presently can be confined to that period, and thus they are of limited utility as chronological markers

(Iroquois Research Institute 1980:42). Roper (1977a:169-170) and Joyer and Roper (n.d.:12) include Big Sandy Side Notched and Jakie Stemmed pp/k as Middle Archaic horizon markers.

At Rodgers shelter the lack of evidence of major hunting activity and the relative dearth of deer remains, which characterized the Early Archaic horizons, continued into the Middle Archaic, and many of the earlier processing, maintenance, and manufacturing activities persisted as well. However, the emphasis in small game hunting shifted from squirrels to rabbits, possibly reflecting a focus on zones outside the bottomland forest; plant processing declined significantly; the processing of local hematite pigment became an important activity; and for the first time freshwater mussels were utilized on more than an incidental basis (McMillan 1976b:225). The majority of Middle Archaic sites in Truman Reservoir continue to occur in the bottoms, but they are found in bottomlands of all widths and are "positioned such that much of the readily accessible land within one mile of the site is bottomland (Joyer and Roper n.d.:12). A "base camp"/"limited activity site" dichotomy of settlement types is suggested to have occurred in the Sac River Valley (Roper 1977b:84), but such a pattern is not yet evident in the Truman Reservoir (Roper 1977a:172).

The Middle Archaic period in the Truman Reservoir corresponds with the locally warm, dry Hypsithermal climatic interval which saw extensive replacement of upland forests by grasslands. The apparent shift to increased reliance on bottomland and aquatic resources was probably a response to these deteriorating climatic conditions. Toward the end of this interval (ca. 6300-3000 B.P.) denudation of hillside vegetation and consequent erosion peaked (Ahler 1976:137), and Rodgers shelter was apparently abandoned (McMillan 1976b:225). However, open air sites in the main river valleys such as Phillips Spring (Chomko 1978), as well as some rockshelters (Roper 1977a:26), continued to be occupied. The impact of the advancing grasslands may also be reflected in the fact that Middle Archaic sites are far more common in the Ozark Highland portion of the reservoir than in the Western Prairies (Roper 1977a:170).

Late Archaic (4000-2000 B.P.)

The Late Archaic is represented in the Truman Reservoir by a large number of pp/k styles including Afton, Smith, Etley, Sedalia, Nebo Hill, several square stemmed varieties, and perhaps Cupp and Table Rock Stemmed (Joyer and Roper n.d.:13). Joyer and Roper (n.d.:13-14) note that "for really the first time in the cultural sequence in the central Osage basin a wide diversity of point styles is represented during the Late Archaic period." Coincidental with the emergence of Late Archaic culture were the end of the Hypsithermal, the return of the upland forests, greatly reduced stream aggradation, and, possibly, increases in stream volume (Joyer and Roper n.d.:13).

Several cultural trends are suggested to have taken place during the Middle to Late Archaic transition and during the latter period. First, some regional differentiation is evident in the distribution of pp/k styles, particularly the near exclusive occurrence of Etley pp/k in the eastern Ozark Highland portion of the reservoir and Nebo Hill pp/k in the northwestern portion of the reservoir in the Western Prairie (Joyer and Roper n.d.:14). Second, the general character of the cultures of the central Osage basin appears to have shifted from a marginal expression of southeastern

lithic complexes to a more localized "interface of cultural complexes all or mostly centered in the lower Missouri and central Mississippi river drainages" (Joyer and Roper n.d.:14). Third, the increasing diversity in locations and extent of sites, as well as the density and kinds of artifacts at these sites, suggests a more extensive subsistence/settlement system. Sites now occur not only in main valley bottomlands but in wide valleys, narrow valleys, uplands, and along small streams well up the drainage network (Joyer and Roper n.d.:15). Fourth, the addition of horticulture to the subsistence system is evident in the presence of squash seeds in contexts dating to 4310 B.P. and 3927 B.P. at the Phillips Spring site (Chomko 1978; Chomko and Crawford 1978). Fifth, the faunal and artifact remains at Rodgers shelter show a substantial increase in the importance of hunting and a shift from a focus on hunting small game to the hunting of deer (McMillan 1976b:225-226). River mussels and nuts were also important food items (Roper 1977a:27-28). Sixth, the Late Archaic horizons at Rodgers shelter show more evidence of ceremony or ritual than preceding periods (McMillan 1976b:226). And finally, the dramatically increased number and density of Late Archaic sites in the Truman Reservoir may represent a local increase in population (Joyer and Roper n.d.:13).

Woodland (2000-1000 B.P.)

Diagnostic Woodland characteristics in the Truman Reservoir area include the introduction of grit-tempered ceramics; such pp/k types as Gary, Langtry, Snyders-like, Rice Side Notched, a variety of generalized corner-notched forms, and possibly Cupp (cf. Chapman 1980:307-308); small arrowpoints including Scallorn and possibly some unnotched triangular and leaf-shaped forms; and burial of the dead with accompanying grave goods in rock cairns on bluffs tops.

The Woodland period of the central Osage basin began about 1000 years later than elsewhere in the Eastern Woodlands, and Roper (1979) has noted that it is extremely difficult to apply the traditional early, middle, and late divisions to the Woodland assemblages of this region. Pottery from a storage pit at the Boney Spring site, which also contained a nutting stone, wild seeds, acorns and other nuts, and squash, has been identified as Early Woodland and dated to about 1900 B.P. (King and McMillan 1975:112-115; Chapman 1980:10). A small number of sherds with Hopewellian characteristics such as dentate stamping, punctations, punch and boss, and zoned dentate stamping have been found in the general project area as well as Snyders-like corner-notched pp/k. It has been suggested that these remains represent short-term hunting and gathering expeditions from Hopewellian centers outside the region (Chapman 1980:27; Roper 1978), but Roper (1979:10) has more recently suggested that the borrowing of a few Hopewellian ideas and items by local populations is more likely to have happened.

The Woodland culture of the central Osage basin remains largely undifferentiated in a chronological sense. Roper (1977a:181-184) has attempted to define an earlier Late Woodland I, represented by the larger Gary, Langtry, and Rice Side Notched forms, and Late Woodland II, represented by the smaller Scallorn, triangular, and leaf-shaped points, but acknowledges that the available data do not support such a division.

Roper now believes that local populations remained in the central Osage basin during the Woodland period but that they were not significantly affected by the emergence and expansion of Hopewellian cultures relatively short distances away. The explanation for this conservatism, Roper suggests, is that the narrow valleys and relatively limited natural productivity of the central

Osage basin could not support increasing populations and specialized non-subsistence activities (Roper 1978, 1979).

The one relatively elaborate late prehistoric cultural manifestation in the general project area is the Fristoe burial complex or aggregate of the lower Pomme de Terre Valley (Wood 1961, 1967; Chapman 1980:93-99). The Fristoe Burial aggregate was initially associated with the Lindley focus or phase characterized by largely undecorated limestone or chert tempered pottery (Wood 1961:107), and it was suggested that this mortuary complex was a development out of local Woodland period cultures that was semi-sedentary with some dependence on horticulture and was relatively unaffected by more complex outside groups despite maintaining extensive exchange relationships with them (Wood 1967). Chapman (1980:98-100) suggests that three separate complexes may be represented in the Fristoe Burial aggregate. The earliest is believed to represent Middle Woodland intrusions, possibly from the Cooper area in northeastern Oklahoma or the Kansas City or Big Bend centers to the north and dating to sometime between 2100-1600 B.P. The second complex is dated to about 1600-1100 B.P. and is characterized by small rock cairns containing the bones of individuals who have been exposed or cremated elsewhere accompanied by relatively modest grave goods including Rice Side Notched and Scallorn points, flake tools, rubbed hematite, and marine shell (*Anculosa*) beads. The third complex includes larger rock cairns with more elaborate grave goods such as the Fairfield Mound 2 with its famous conch shell gorget with an engraved jaguar (Chapman 1980:Figure 4-8; Wood 1961:Figure 8) and dates into the Mississippi period from about 1100 to 600 B.P.

Woodland settlement patterns in the Truman Reservoir area are as yet not well understood. Late Woodland sites are found far upstream on the smaller local tributaries (Roper 1977a:203-204), but whether the initial impression that Late Woodland sites are more evenly distributed throughout the drainage network is valid can only be determined by further research (Roper 1977a:197). Roper (1977a:35) notes that the literature from the Truman Reservoir area suggests that the local Woodland settlement system is comprised of small terrace edge "hamlets" with "ancillary hunting camps" in open sites and in shelters. Such a settlement system appears to have been operative also in Late Woodland times on the Sac River (Roper 1977b:94).

Mississippian (1000-300 B.P.)

Readily identifiable Mississippian remains are rare in the Truman Reservoir. The Western Prairie portion of the area "seems to have been hunting territory for late prehistoric villagers from the Central Plains edge--particularly Caddoan and Steed-Kisker--without supporting a complete settlement system for either of these groups" (Roper 1977a:35). However, the ceramic assemblages in the Ozark Highland portion seem to show no western influence (Roper 1977a:235). The environmental constraints discussed above appear to have precluded significant Mississippian intrusion or the development of local Mississippian cultures in the Ozark Highland, and it may be that structurally simple Woodland societies persisted in the region until nearly historic times (Roper 1977a:235, 1979:11). Evidence of Mississippian influence can be seen in the scattered occurrences of shell-tempered pottery and in the continuation and elaboration of the Fristoe Burial complex in the Pomme de Terre valley (Wood 1961, 1967).

CHAPTER VI

Historical Background

In contrast to many earlier archaeological salvage and cultural resource management projects which paid scant, if any, attention to historical and architectural resources, such resources in the Truman Reservoir area have been addressed in some depth. The historical background of the Pomme de Terre Valley is discussed by Synhorst (1976), and an architectural survey of the lower Pomme de Terre Valley is described by Linderer (1976). Forthcoming draft reports to the Corps of Engineers include two volumes prepared by Synhorst which include Osage River history and a historical gazeteer which concludes with recommendations for mitigating the adverse effects of the Truman Reservoir on historical resources. A third volume by Linderer describes the architectural survey of the reservoir area and recommends mitigation procedures (Roper 1977a:ii). In addition, a literature review of the prehistoric and historic cultural resources in the Warsaw area has been prepared by Cooley and Turner (1979). The following historical summary of the Warsaw area has been excerpted with minor revisions from Cooley and Turner's report (1979:104-108).

Although most Osage Indian settlements in the central Osage River Valley were located in the broad river bottoms of the prairies to the west of the Truman Reservoir area (Roper 1978:10), several Osage settlements are reported to have been near the mouth of the Pomme de Terre River (Lay 1876:9-10).

One of about 300 wigwams stood in the prairie bottom now covered by the farms of Mr. N. Campbell, Mr. Johnson and Mr. Holland. Five large heaps of stone on the ridge, at the junction, and between Little and Big Pomme de Terre Creeks, mark their graves (Lay 1876:10).

An even larger village was reported to be at the mouth of Hogle Creek just to the west. References to other historic tribes in the area include a Shawnee village of 200 or 300 persons in the Shawnee Bend opposite the mouth of the Grand River (Lay 1876:10). It is also believed that a band of Kickapoo occupied the present site of Warsaw, and that there was a Shawnee village in Heath's Bend (Goodspeed 1889:463).

John F. Hogle, a German, and Narcisse Penseneau, a Frenchman, established a trading post in the Indian village at the mouth of Hogle Creek. The year of their arrival is not known, but it was many years in advance of permanent settlers (Goodspeed 1889:464). Ezekiel Williams was the first Anglo-Saxon settler in what is now Benton County. He came in the winter or early spring of 1830-1831, to the northwest part of the county, southwest of Cole Camp (Lay 1876:15-16). In 1831 Lewis Bledsoe settled on the Osage River one-half mile above the present site of Warsaw, on the old military road from Palmyra to Springfield. He established a ferry on the Osage River in a location a short distance below what was to be the site of Truman Dam and just above the project area (Figure 3). Several settlers purchased land from the Indians in 1831 and 1832, in what later became Warsaw and environs (Goodspeed 1889:464-465).

During the fever of land speculation from 1833 to 1836 " . . . a great tide of emigration westward began to flow along the westward border" (Lay 1876:19). There were many arrivals in Benton County at that time. Nearly all of the settlers who came prior to 1840 located along the creeks in the timber and generally on bottomland near springs. They opened fields to "raise bread," and obtained meat by hunting. Floods in the 1840s caused many to move to higher ground. It was around 1840 that settlers began to locate on the prairies, but always near the timber (Lay 1876:23). The pioneers, mostly Virginians and Kentuckians, were familiar with timber, streams and springs, and, according to Goodspeed (1889:472), knew nothing of the value of the prairie land.

Benton County was created January 3, 1835, and included portions of what is now known as Pettis and Hickory counties (Goodspeed 1889:476-477). The county was named for Thomas Hart Benton. In 1845, Hickory and Pettis counties were formed, leaving Benton County's boundaries as they are today. The county seat was set as near as was possible to the center of the county on the Osage River. The site selected, today the town of Warsaw, was near the house of Stephen A. Howser and Gillett's Mill. In 1838, the town was laid out and lots were put up for sale. This was in a remote area with the nearest crossing of the Osage at Bledsoe's Landing, called Osage. Only a slim path connected the new county seat to the Sedalia Road.

Several businessmen opened general merchandise establishments in Warsaw in the 1840s. They outfitted many people on their way to California (Goodspeed 1889:500).

The "Slicker War" was a major event in the history of Benton County. Superficially it was a feud between the Jones and Turk families, but it actually represented a complex social conflict between old and new settlers of the region (Synhorst 1976:77). The term "slicker" evolved when beatings would draw enough blood to render the victim "slick". Lawful procedures were unable to cope with the situation, and the vendetta lasted from 1840 to 1843, when the major participants were eventually murdered (Lay 1876:46-61).

The planners' foresight in placing the county seat on the navigable Osage River is reflected by the growth of Warsaw during the 1850s. At high-water, boats ran to Osceola and as far upstream as Harmony Mission, but Warsaw was considered the head of normally navigable waters on the Osage. By 1859, 8000 tons of freight had been shipped from St. Louis to Osage River destinations. Water transportation, combined with Warsaw's location on the north-south road from the Missouri River to Southwest Missouri, resulted in the town's becoming a flourishing trade center (Sauer 1920:143).

During the 1840s and 1850s, stage lines ran from Palmyra, Missouri, to the Cherokee nation, crossing the Osage at Bledsoe's Ferry which was about halfway between (Stevens 1915:129). In October 1858, the first Butterfield Overland Mail stage left Tipton, Missouri, passing through Warsaw on its 25-day trip to California. This service lasted up to the time of the Civil War (Meyer 1970:253, 746).

Many of the residents of Benton County were slave owners in 1860, with seven percent of the population being slaves (Meyer 1970:3-17). Several of the prominent politicians of the county were southern democrats and along with many citizens in Warsaw were sympathetic to the southern cause. The Germans around Cole Camp, loyal to the Union, organized into the Home Guards. In June 1861, a surprise attack by the Warsaw group scattered the Cole Camp Home Guards in a bloody battle. In the late summer the Warsaw companies followed Governor Jackson's forces south to Wilson Creek, and returned to Warsaw after the battle. With the defeat of the Confederate forces at the

battle of Lexington in the fall of 1861, the southerners retreated from Warsaw and the town was under control of Union forces for the duration of the war except for raids and bushwacking expeditions (Lay 1876:71-72).

Warsaw's early economic successes were first diminished by the calamities of the Civil War, and then by the coming of the great railroad lines which ended the flourishing steamboat trade (Goodspeed 1889:502). Benton was a Civil War border county in a state in which the general population and even families held divided sentiments. Both Union and Confederate armies passed through the area and wreaked havoc in passing, and many of the citizens of the area contributed to the violence individually or in organized lawless bands (Goodspeed 1889:498).

Following the Civil War, Warsaw reemerged as an economic center of the region as noted by Judge James Lay's statement at the conclusion of his centennial history of Warsaw: ". . . the return of peace soon revived the energies of the people and the population and wealth of the County in a short time exceeded what it was before the war" (1876:73). However, fluctuations in the level of the Osage River, where steamboats often sank or became stuck, and the completion of a narrow-gauge railroad between Sedalia and Warsaw in 1880 (White and White 1978:67) brought about a shift in the economic basis to an overland market. The railroad was ultimately taken over by the Missouri Pacific and changed to standard gauge. The line served the community until the 1940s, when it was discontinued (White and White 1978:67).

The area from the mouth of the Pomme de Terre east through Warsaw is sometimes called "The Land of the Swinging Bridges" for the many wire suspension bridges that crossed the Osage and Pomme de Terre rivers, beginning with the first one in 1895 (Synhorst 1976:55-56). One of these early bridges collapsed with a load of cattle in 1912 (Cooley and Turner 1979:107). Two abandoned bridges of this type remain standing in the project area today (Figure 3).

From the beginning Warsaw's history has been associated closely with the Osage River. Synhorst (1976:56) notes that "Warsaw and Benton County have always been less isolated than Hickory County," largely because of the Osage River. Today the economy and character of Warsaw continue to reflect events connected with the river. The Lake of the Ozarks hydroelectric dam (Bagnell Dam), completed on the Osage River in 1931, caused water to inundate areas up to and above Warsaw. Recreational use of that lake by tourists and the related businesses are important in the Warsaw economy.

When the construction of Bagnell Dam did not appear to effectively control the flooding of the Osage, planning began in the 1950s to construct the "Kaysinger Bluff Dam" one mile up the river from Warsaw. In 1970, the name of the project was officially changed to the Harry S. Truman Dam and Reservoir. The spillway was closed in 1979, and the inundation of 55,600 acres began. The descendants of many of the first settlers still reside in the area and many other citizens are present who have a lively interest in Warsaw's past and future; the town surely will continue to grow and be a vital and integral force in the state (Cooley and Turner 1979:108).

CHAPTER VII

Literature Review and Records Check

Prior to the field survey several sources were consulted to provide a background out of which a project-specific research design could be developed. These sources include several draft and final reports to the U.S. Army Corps of Engineers on archaeological work conducted in and around Truman Reservoir (see Previous Archaeological Research); the records of the Archaeological Survey of Missouri and the Historic Sites and Buildings Inventory of the Historic Preservation Program, Missouri Department of Natural Resources; the Annual Listing of Historic Properties, National Register of Historic Places (Federal Register, Vol. 44, No. 26, February 6, 1979, and Vol. 45, No. 54, March 18, 1980); the Surveyor General's Office map of Township 40 North, Range 22 West, dated June 20, 1839; and the 1904 plat map of T40N, R22W in the Benton County Atlas (Anonymous 1904).

More than 1400 archaeological sites have been found in the Truman Reservoir area and recorded with the Archaeological Survey of Missouri (Roper 1977a:229). A large number of these sites are included in the more than 1000 sites recorded in Benton County. However, a check of the records of the Archaeological Survey of Missouri (David R. Evans, personal communication) as well as a review of the extensive literature on the general survey area indicated that there were no previously registered archaeological sites that would be directly impacted by this project.

Three historic sites appear to be in the project area. Two suspension bridges which were built across the Osage River between 1895 and 1908 are in areas of proposed levee construction (Figure 3). These sites are listed on the Missouri Historic Sites and Buildings Inventory, and both bridges have been reconstructed (Joetta Davis-Smith, Missouri Historic Preservation Program, personal communication; cf. Cooley and Turner 1979:107-108, 110; Synhorst 1976:55-56).

A third historic site which appears to lie in the project area is a ferry landing which is shown on the 1839 map of the Surveyor General's Office of Township 40 North, Range 22 West. The ferry landing is at the point where the old Road from Boonville to Kickapoo Prairie crossed the Osage River. One of the remaining swinging bridges noted above, which is the former river crossing for Missouri Highway 7, is in the approximate location of the ferry landing (Figure 3).

No standing structures or other historic sites are in the project area as reported by the Missouri Historic Sites and Buildings Inventory (Joetta Davis-Smith, personal communication). No structures are shown to be in the project's direct impact areas on the 1839 Surveyor General's Office map of T40N, R22W or in the 1904 plat map of the same legal location (Anonymous 1904). The 1839 map shows several fields in the project area. No sites in the project area are listed on the National Register of Historic Places.

CHAPTER VIII

Research Design

In the face of a rapidly diminishing cultural resources data base it has become clear to archaeologists that two of the most important aspects of managing such resources are the determination of research priorities and the development of criteria for assessing significance of sites in terms of their potential for inclusion in the National Register of Historic Places. Nearly 20 years ago Binford (1964) stated that past cultural systems could be studied most effectively through the development and application of regional research designs, and more recently Raab and Klinger (1977) have stressed the value of assessing archaeological site significance from within the context of explicit, problem-oriented research designs particularly those which are regional in scope.

A research design has been defined by Goodyear, Raab, and Klinger (1978:161) as,

. . . an explicit plan for solving a problem or set of problems. It is a plan that must contain theoretical goals in the form of a specific problem or hypothesis, relevant analytical variables, and specification of data that will allow empirical testing. To be complete, the design must lay out the methods and techniques for acquiring and analyzing the data, and predict the expected outcomes of the analysis.

Archaeological research designs should address themselves to two sets of considerations--those relating to cultural resources management and those relating to research questions in archaeology and related disciplines. These considerations which should be explicitly identified will provide a context within which project-specific research designs can be developed. Such designs must, of course, be dynamic and adaptable to new data, research problems, and management considerations (Sharrock and Grayson 1978; Lynott 1980).

Cultural Resource Management Considerations

The primary goals of the project relating to cultural resource management have been discussed in the preceding section and at greater length in the project scope of work (Appendix I). These goals include:

1. Locating all archaeological sites in the project/survey area which can be observed by standard archaeological surface survey methods;
2. Identification of the patterns of site distribution in the project/survey area to the extent possible through surface survey;
3. Identification of the "nature" [environmental context, cultural-temporal affiliation(s) and use/function(s)] of each site to the extent possible through standard surface collections methods;

4. Construct a predictive model for prehistoric cultural resources in those portions of the project area which could not be effectively surveyed by standard surface survey methods and develop a plan for further investigation to locate and assess such sites;
5. Assess the significance of any archaeological sites located in terms of the criteria of the National Register of Historic Places;
6. Assess the probable impact of the proposed project and future projects on archaeological resources in the project/survey area.

Archaeological Research Questions

Although the principal purpose of this survey is to address cultural resources management considerations, a second goal is to obtain substantive archaeological data to be used in addressing research questions and testing hypotheses pertaining to archaeology and related fields. As a result of the survey the local and regional data base might be expanded and made more representative, previously stated hypotheses might be tested, and new research questions and hypotheses might be proposed.

In addition to its scientific importance, this goal is also directly related to cultural resource management considerations for, as Cynthia Price (1979:21-22) has noted, "the National Register criteria for significance of archaeological sites take into consideration the potential of archaeological sites for contributing useful information regarding human paleo-ecology, culture history, or cultural process" (36 CFR Part 63, Appendix A; cf. C. Price 1978a:37-42).

Major research goals relevant to the project/survey area have been developed for various subregions within the Ozarks including the Harry S. Truman Dam and Reservoir area (Roper and Wood 1976; Roper 1977a:1-9, 35-36), the upper James River watershed of the western Ozarks (Douthitt 1980), and the eastern Ozarks (C. Price 1978a; J. Price and C. Price 1975, 1980). The primary research goal of these investigations is the identification and explanation of changing human adaptations to the natural environments of the Ozarks with an emphasis on the study of human subsistence and settlement systems (J. Price and C. Price 1975:75; Roper and Wood 1976:41-42). Three general levels of research questions have emerged from this focus: 1) the nature of subsistence and settlement systems of the locality or other spatial entity under consideration; 2) the relationship of the past cultures of the study area (specifically their subsistence and settlement systems) to the surrounding area; and 3) on a theoretical level, the investigation of "general principles as to how people use their natural environment--that is, how they disperse themselves and their activities across the landscape; why they disperse themselves and their activities across the landscape; why they locate where they do; how they extract energy from the natural environment; and why these patterns change" (Roper and Wood 1976:42). As recent studies of Ozark Localities have shown (Roper 1979; J. Price and C. Price 1980) the persistence of subsistence and settlement systems and other cultural patterns in the Ozarks is another of the region's cultural phenomena demanding explanation (cf. Purrington 1971).

Project-Specific Research Design

The scope of work for this survey calls for field strategies which are consistent with the management and research goals described above.

Specifically these strategies include:

1. A 100 percent surface reconnaissance of the project area;
2. Determination of site boundaries when possible;
3. Collection of samples of surface cultural material at each site;
4. Recording of provenience of features, including maps and graphs where applicable.

These strategies, which emphasize the potential research value of each site in the project area, are far more likely to provide a data base which will allow an assessment of site significance that is consistent with the management and research goals outlined above than would a less intensive approach. In addition, environmental characteristics of the project area and each archaeological site were recorded in an attempt to shed further light on past adaptive strategies in this locality and to add to the data base for assessment of site significance. Particular attention was paid to the environmental variables recorded by Roper in her analysis of the Truman Reservoir sites (Roper 1977a:187-220) and those from below Stockton Dam (Roper 1977b: 80).

Laboratory/analytical procedures specified in the scope of work include "identifications of cultural materials to answer the research design" (Appendix I). Since the research designs applied to the Harry S. Truman Reservoir area and elsewhere in the Ozarks emphasize persistence and change in subsistence and settlement systems, the use of cultural-temporal and use-functional categories in the classification of artifacts and sites is called for. The identification of distributional patterns of sites, called for in the scope of work is also consistent with the research goals discussed above.

CHAPTER IX

The Field Reconnaissance

Description of the Project/Survey Area and Conditions Affecting the Survey

The primary environmental variables affecting the survey related to weather, surface visibility, and ease of movement. The survey was conducted under extreme summer and winter conditions. On January 5, 1980, the weather was cloudy with intermittent drizzle and a temperature of about 40°F. January 7-11, 1980, had clear skies, but daytime temperatures were in the low to mid-twenties, and a light to moderate breeze was generally blowing. The breeze and cold temperatures introduced a significant element of risk, as well as physical discomfort, to surveying along the edge of the Osage River. The final day of survey, July 31, 1980, was sunny with temperatures reaching 105°F.

The project/survey area, consisting of about 500 acres, can be broken up into several tracts (Figure 5). These individual project/survey areas can be described as follows:

Tract 1 (levee)--edge of terrace between Osage River and flooded backswamp; mixed hardwood forest with dense poison ivy thickets; river bank ca. 1.5 to 2.25 meters high and steep with some undercutting; poor surface visibility along length of project area (0-5%) but excellent visibility along bank and shore of river (80-100%); some deadfalls along river bank impeded access. The estimated percentages of surface visibility for this and other units are shown in Figure 5.

Tract 2 (ring levee)--edge of terrace; tall grass and weeds; surface visibility poor (0%) except along edge of roads (40%).

Tract 3 (borrow area)--terrace beside intermittent stream at foot of valley slope and in front of flooded backswamp; short grass; surface visibility poor (0-3%) except for edge of road (30%).

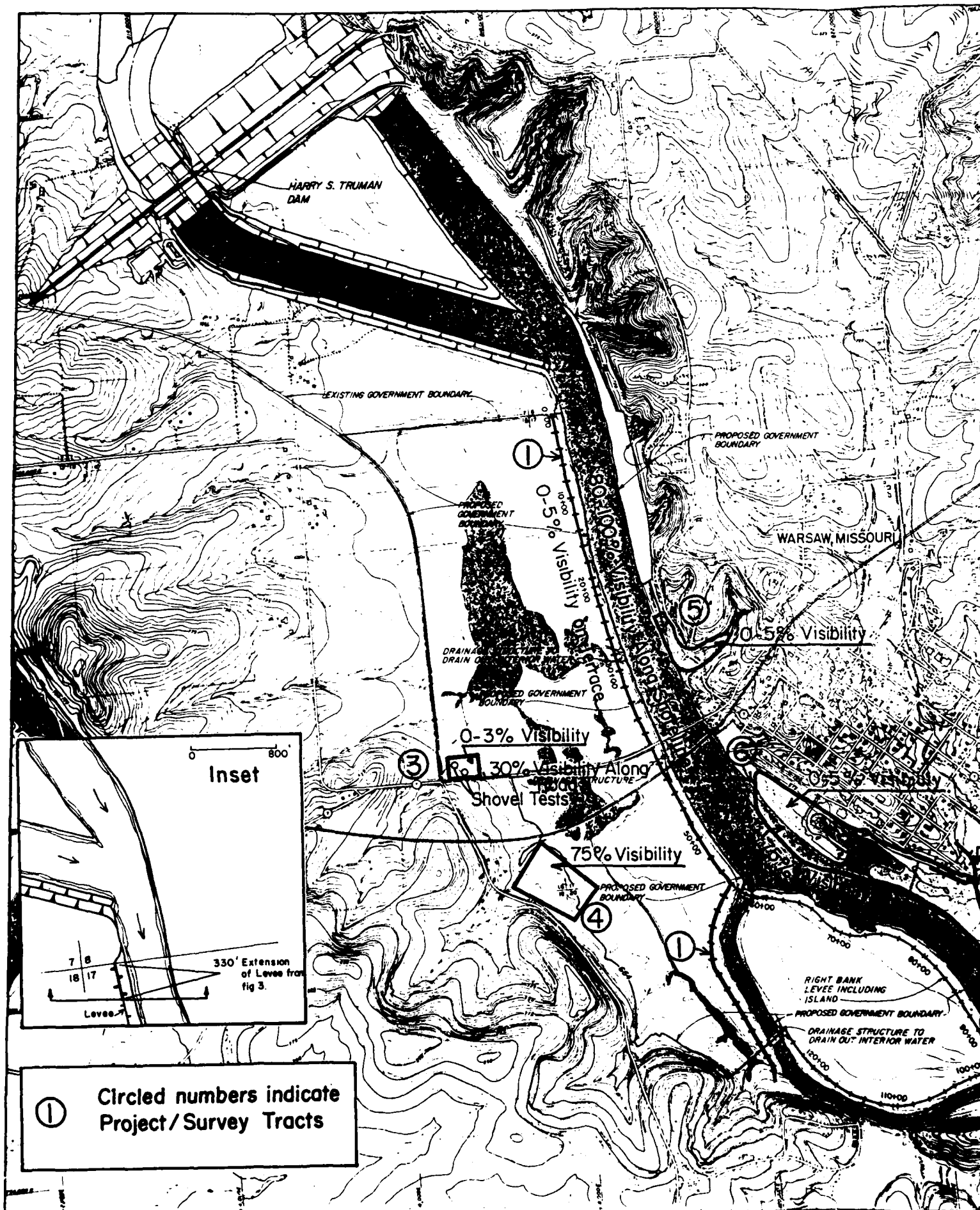
Tract 4 (borrow area)--low terrace (occasionally flooded according to landowner) along intermittent stream and at foot of steep valley slope; hog pasture with sparse grass and weeds; surface visibility good (75%) and fairly uniform.

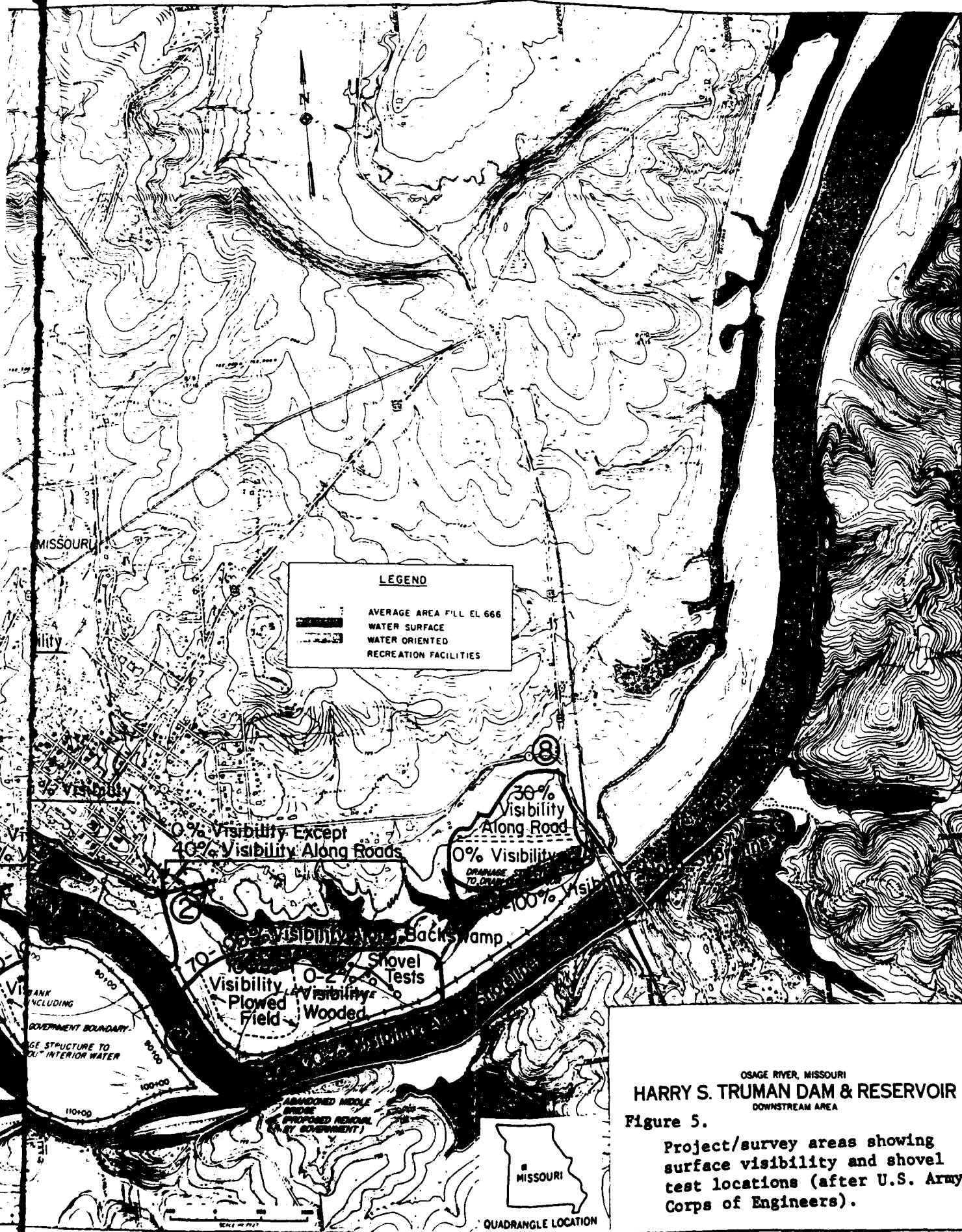
Tract 5 (reconstruction of water-oriented recreation facilities)--moderately steep valley slope to river edge; highly disturbed by modern construction; shoreline graveled.

Tract 6 (relocation of water-oriented recreation facilities)--very low floodplain terrace (ca. 0.5-1.0 meter above river level) on edge of river; grass and tall weeds; surface visibility poor (0-5%) except along shore line (75%).

Tract 7 (fill)--floodplain terrace on river edge with backswamp behind it; one-third in fallow field (plowed at time of July 31 survey) and two-thirds in second-growth mixed hardwoods; surface visibility poor in forest (0-2%) and in fallow field (0-5%); very good along shorelines of backswamp (70-100%), and excellent along river shoreline (90-100%); the surface of the plowed field was entirely exposed, but visibility was somewhat limited by the extreme dryness of the soil; roads and scattered tree-throws provided small areas of improved surface visibility.

Tract 8 (fill)--low terrace between gently sloping valley wall and





flooded area; part of this unit was flooded and the remainder was wooded or in weeds and tall grass; surface visibility poor (0%) except along road through center of unit (30%).

Survey Methods

The reconnaissance was carried out in three stages. Stage 1 was a preliminary general overview and selective reconnaissance conducted by the principal investigator on January 5, 1980. The purpose of this stage of the survey was to obtain a general impression of survey conditions and the potential kinds of cultural resources that might be expected in the project/survey area which would aid in refining the research strategy for the intensive reconnaissance. The entire project/survey area was viewed from a field vehicle and tracts 1, 3, and 7 were investigated on foot. Archaeological sites 23BE1010 and 23BE1008 were noted in tracts 1 and 7, respectively. Since both sites are linear scatters along the shoreline of the Osage River, a controlled surface pick-up in 10-meter grid units was chosen as a sampling strategy. Sampling units 10-20 meters south and 20-30 meters south of a selected control point were collected at 23BE1010, but collecting at 23BE1008 was deferred until the intensive reconnaissance. Much of the interior of tract 7 was walked over to assess surface visibility and 3 1/2 m. X 1/2 m. shovel tests were excavated in the wooded area on the east side of this survey tract (Figure 5). The semi-frozen soil from the shovel tests was troweled through. No archaeological remains were found as a result of this unsystematic surface walkover or in the shovel tests.

Stage 2 was an intensive reconnaissance conducted by 3 research technicians from January 7-11, 1980. The purpose of this stage of the survey was to conduct an on-site, pedestrian reconnaissance of 100 percent of the project area. Stage 1 of the survey had suggested several approaches to take in the intensive survey:

1. Archaeological remains in the low floodplain terraces near the Osage River appear to be buried by 1 to 2 meters of alluvium; therefore, shovel tests and surface inspection are not likely to reveal archaeological remains in these heavily overgrown tracts. The survey in tracts 1, 6, 7, and 8 should include the following:
 - a. a walk-over of all land to identify exposed surfaces,
 - b. visual inspection of all exposed surfaces,
 - c. minimal excavation of shovel tests,
 - d. no soil augering because of the frozen or moist character of the soil,
 - e. intensive surface investigation of shorelines since these are the locations in these tracts in which archaeological remains are most likely to be exposed.
2. Archaeological sites along the shorelines are exposed as linear scatters which can be easily collected by a controlled sampling strategy. All such sites are to be collected in 10 meter linear

units with a 100 percent collection of surface archaeological remains. Widths of such units vary with the shoreline but average about 3 meters.

3. Since earlier research designs for the Truman Reservoir area and other Ozark localities emphasize the study of cultural-environmental interaction and stability and change in subsistence and settlement systems, the environmental characteristics of archaeological sites as well as those locations and settings in which sites were not found should be described.
4. If archaeological remains are present along the edge of the valley, they may be closer to the ground surface and, therefore, shovel testing will be employed in relatively undisturbed areas of poor visibility.

Unfortunately, the cold temperatures and low chill factor, plus semi-frozen ground and reportedly higher river levels, hindered the Stage 2 reconnaissance, particularly shovel testing and the intensive survey of the shorelines. A small number of shovel tests were excavated in the moist, semi-frozen ground, but these were fewer and more selectively dug (concentrated on relatively undisturbed, poor-visibility tracts along the edge of the valley) than would have been the case under better circumstances. The shoreline at sites 23BE1008 and 23BE1010 had narrowed considerably because of a rise in the level of the Osage River and, since the surveyors did not consider a controlled surface pick-up to be potentially productive, general collections were made at the sites. Cold air and water temperatures and an even lower chill factor produced by mild to moderate breezes added a threatening note to the shoreline survey. Rummaging around in the water for flakes was exceedingly uncomfortable, and a fall into the river while attempting to negotiate a deadfall, which would have been a delightful dip in July, was a clear and present danger in January.

Nevertheless, the second stage of the reconnaissance followed the general field strategy in that all project areas were walked in their entirety, and all exposed surfaces were visually inspected. Exposed shorelines were in tracts 1, 5, 6, 7, and 8. Dirt or gravel roads were present in tracts 2, 3, 5, 6, 7, and 8, and all were visually inspected. Other exposed surfaces, including areas of modern disturbance in tracts 1, 2, 4, 5, and 7, were also visually inspected. Two 1/2 m. X 1/2 m. shovel tests were excavated in tract 3; the soil was troweled through and soil samples were collected.

Parallel transects were walked across all tracts with the surveyors spaced 15 to 25 meters apart; transects were more narrowly spaced when ground cover was dense and/or high. The shorelines were walked by one person with a second surveyor on the terrace immediately above and the third surveyor walking the terrace or the shoreline, taking notes, or scouting ahead as needed. At each archaeological site a general surface collection was made by two surveyors while the third surveyor recorded field notes.

The third stage of the reconnaissance was a follow-up to the second stage and was conducted on July 31, 1980, by the principal investigator. This stage included obtaining controlled surface collections at the two shoreline sites, 23BE1008 and 23BE1010, and making a surface survey of the now plowed field in tract 7. Surface collections at 23BE1008 and 23BE1010 consisted of 100 percent pick-ups in 10-meter sampling units, and the exposed portions of both sites were collected in their entirety. The river was significantly lower than its

winter level and surface visibility along the shore proper was very good except where drying had occurred. The banks were extremely dry which made it very difficult to see artifacts or other archaeological remains in situ and virtually impossible to identify soil strata. A dark organic zone which began about 1.75 meters below ground surface at 23BE1010 had been noted in Stage 1 of the reconnaissance, but it was now invisible. Samples of soil from each of five strata identified in the Stage 1 survey were collected at this site. Since color differences were no longer visible, the samples were recovered at the depth below ground surface of the approximate center of each stratum, as it had been estimated in the Stage 1 survey.

The plowed field in tract 7 covered about 20 to 25 acres. The very dry surface was visually inspected by walking parallel transects 15 meters apart.

Results of the Reconnaissance

Four archaeological sites were discovered as a result of the reconnaissance and have been recorded with the Archaeological Survey of Missouri as 23BE1007, 23BE1008, 23BE1009, and 23BE1010. No archaeological sites were located in any of the remaining areas surveyed and the predominantly surface survey was of sufficient intensity to suggest that no archaeological resources are likely to be in these locations unless they are buried. A summary of the reconnaissance follows:

Tract 1--intensive survey of terrace surface and shoreline along entire tract. Site 23BE1009 was discovered in a bulldozed area, and 23BE1010 was found along the shoreline. No evidence of the ferry landing noted on the 1839 Surveyor General's Office map was found. Evidence of this site may have been destroyed by construction of the old Highway 7 bridge (Figure 5).

Tract 2--surface investigation of exposed areas including roads. No archaeological resources found.

Tract 3--surface investigation of road on south edge of tract and excavation of two shovel tests. No archaeological resources found.

Tract 4--surface investigation of all exposed surfaces. Site 23BE1007 was discovered. This site is a light lithic scatter, perhaps no more than 5- to 10-meters wide and extending a distance of about 80 to 100 meters.

Tract 5--intensive visual inspection of all exposed surfaces. Nearly all of tract disturbed by modern construction. No archaeological resources found.

Tract 6--intensive visual inspection of all exposed surfaces including shoreline and dirt roads. No archaeological resources found.

Tract 7--intensive visual inspection of all exposed surfaces including river shoreline, backswamp shoreline, dirt roads, and disturbed areas. Excavation of three shovel tests in wooded area on east side of tract. Archaeological remains from site 23BE1008 found eroding from river bank at an undetermined depth below surface. No archaeological remains found on the ground surface or in shovel tests.

Tract 8--intensive surface inspection of exposed surfaces including road through center of tract. No archaeological resources found.

CHAPTER X

Description of Archaeological Sites

The Gaylord Pasture Site, 23BE1007

Site Location and Extent

Site 23BE1007 consists of a very light lithic surface scatter on a terrace on the edge of the Osage River floodplain at the entrance of an intermittent first order stream into the main valley. The cultural material was recovered from a narrow strip about 10 meters wide and 80 to 100 meters long, which follows the front edge of the terrace. Surface visibility at the time the site was surveyed was about 75 percent. No midden was evident.

Relationship to the Project Area and Anticipated Impact

The entire site, as its boundaries are now known, lies in the project's direct impact zone. The soil in this location is slated for removal as fill, and most, if not all, of the site would be destroyed by the project as planned.

Disturbance and Site Integrity

The site is presently in use as a hog pasture and the daily activities of the porcine residents have resulted in overturning of the soil to depths of 30 to 40 centimeters below ground surface. The upper horizons of the site have been thoroughly disturbed and any cultural remains from different cultural-temporal and/or functional contexts undoubtedly have been vertically mixed, although some horizontal context may remain. Since the site lies near the foot of a relatively steep hill and the entrance of a small stream into the main valley, relatively recent colluvial and alluvial sedimentation may have taken place and buried cultural deposits may be present at the site.

Topographic-Environmental Situation

The Gaylord pasture site is located on the front edge of an older terrace at the edge of the main valley of the Osage River. The valley is about 0.55 mile wide at this point and the site is about 250 meters (ca. 0.15 mile) from the bluff base and about 500 meters (ca. 0.3 mile) from the Osage River. About 70 percent of the land within a one-mile radius of the site is on the same side of the river as the site and about 95 percent of the bottomland within one mile of the site is on the same side of the river. The ratio of bottomland to upland within one mile of the site and on the same side of the river is about 40:60.

The site has a northeast exposure, and it is about 50 meters from an intermittent first order stream which enters the valley about 250 meters to the southwest. Extensive backswamps lie immediately in front of and below the site. The site is on the right bank (facing downstream) of the intermittent stream and the Osage River at an elevation of about 660 feet amsl.

The site is on relatively high ground in the Osage River bottoms. Six major environmental zones are within one mile of the site and on the same side of the Osage River, including the river, a well-drained floodplain terrace adjacent to the river, extensive backswamps, an older terrace along the valley margin, a small stream valley, and rugged uplands. In aboriginal times these diverse environmental zones undoubtedly would have offered a wide range of plant and animal food, medicinal, and raw material resources.

The Kowertz Site, 23BE1008

Site Location and Extent

The Kowertz site consists of a light-to-moderate scatter of lithic prehistoric cultural materials which have eroded from a bank of the Osage River and have been deposited along the shoreline. No cultural material was observed in situ in the river bank deposits and no midden zone was evident. Cultural material was distributed in a moderate scatter for a distance of about 80 meters along the shoreline and extended in a light scatter about 50 meters farther south. Visibility along the shoreline was about 95 percent. It was especially good where wave action had kept the soil moist, but it was poorer on the bank profile itself because of the extreme dryness of the soil. Visibility on the ground surface immediately above the shoreline was about 40 percent, but the soil was quite dry at the time of the survey.

Relationship to the Project Area and Anticipated Impact

The entire site, as its boundaries are now known, lies in the project's direct impact area. Proposed activities at the site include levee construction parallel to the river and about 30 meters back from its edge, and, possibly, the removal of fill dirt behind the levee. These activities would result in the burial of portions of the site and disturbance of subsurface remains.

Disturbance and Site Integrity

Bank erosion of the site by the Osage River is presently removing cultural materials from their context. Since no cultural material was evident on the surface, it is probable that the site has been buried by alluvial sediments and that much of it is undisturbed. The soil zones from which the cultural material was being eroded could not be determined at the time of the survey.

Topographic-Environmental Situation

The Kowertz site is located in the Osage River floodplain and adjacent to the river. The floodplain is about 0.45 mile from the edge of the valley. Steep bluffs rise above the river immediately to the south of the site and a large, low island is directly across the river from the site. About 40 percent of the land within a one-mile radius of the site is on the same side of the river as the site, and about 50 percent of the bottomland within one mile of the site is on the same side of the river. The ratio of bottomland to upland within one mile of the site and on the same side of the river is about 30:70.

The site is located in an open exposure on the left bank of the river on what appears to be a relatively high area on the floodplain. The present ground surface is about 2.5 to 3 meters above the river at an elevation of about 640 feet amsl. Further upstream and downstream the river bank is lower and in some cases it drops gradually into a marshy area beside the river. The floodplain behind the site is level for about 200 meters, then it drops gradually into extensive backswamps. Narrow terraces flank the valley, and the foothills rise rather gradually to summits about 160 feet above the valley floor. A first order stream enters the Osage River about 350 meters downstream from the site.

The site is on relatively high ground in this portion of the floodplain. Seven major environmental zones are within one mile of the site on the same side of the Osage River including the river, a well-drained floodplain terrace adjacent to the river, river-edge sloughs, backswamps, an older terrace along the valley margin, small intermittent stream valleys, and rolling uplands.

The Barry Site, 23BE1009

Site Location and Extent

Site 23BE1009 consists of a moderate to heavy scatter of lithic cultural materials on a narrow terrace of the Osage River. The cultural material was recovered from an area of about 20 by 40 meters. The site had been stripped of vegetation and surface visibility was 100 percent. No midden was evident. No evidence of buried cultural horizons was found on the terrace edge or on the shoreline adjacent to the site.

Relationship to the Project Area and Anticipated Impact

Some, if not all, of the site lies in an area of proposed levee construction along the Osage River. Anticipated impacts include burial of the site and probable soil disturbance.

Disturbance and Site Integrity

The entire site and the immediate area around it have been stripped of vegetation and most topsoil by earth-moving equipment. The topsoil remaining at the site appeared to have been overturned. In addition, despite 100 percent surface visibility, only one diagnostic artifact, a badly broken pp/k, was found at the site which is a reflection of the fact that relic hunters have visited the site and removed a significant and non-representative portion of the cultural material from the site--these collectors could not be identified or located. The upper horizons of the site appear to be totally disturbed and their integrity destroyed. No evidence of undisturbed, deeply buried cultural horizons was found.

Topographic-Environmental Situation

Site 23BE1009 is located on a narrow terrace which is sandwiched between

a steep bluff and the Osage River. The valley is about 0.7 mile wide at this point and the site is about 30 meters from the bluff base and about 10 meters from the Osage River. About 70 percent of the land within a one-mile radius of the site (excluding an island opposite the site) is on the same side of the river as the site, and about 25 percent of the bottomland within one mile of the site is on the same side of the river. The ratio of bottomland to upland within one mile of the site and on the same side of the river is about 15:85.

The site is located on the right bank of the Osage River on an older terrace at an elevation of about 660 feet amsl. It has a north exposure. An intermittent stream enters the valley about 50 meters northwest of the site. Extensive backswamps lie immediately below the site. The bluff top is about 100 feet above the site and ridgetops in the rolling uplands immediately above the site are about 160 feet above the valley floor.

The site is on relatively high ground in the Osage River bottoms. It is an unusual location because it is at the confluence of no fewer than six environmental zones including the river, river-edge slough, backswamps, an older terrace, a relatively broad intermittent stream valley, and rolling uplands. In addition, rugged uplands and well-drained floodplain terraces are within a one-mile radius of the site.

The Lotterer Site, 23BE1010

Site Location and Extent

The Lotterer site consists of a moderately dense scatter of prehistoric cultural material which has been eroded from a bank of the Osage River and deposited along the shoreline. Cultural materials are also in situ in the alluvial deposits. They have been observed in a dark organic horizon about 1.75 to 2 meters below surface and in a lighter stratum about 1.50 meters below surface (Appendix III). Cultural material extended about 80 meters along the shoreline; the width of this buried site could not be determined.

Relationship to the Project Area and Anticipated Impact

The site, as its boundaries are now known, lies in the project's direct impact zone. A levee will be constructed over the site which will result in burial of part of the site and possible disturbance of subsurface cultural remains.

Disturbance, Site Integrity

Bank erosion by the Osage River is presently removing cultural materials from their context. However, deeply buried cultural materials are still in situ in and above a dark midden which is well below potential disturbance by cultivation and most other human and natural disturbances. The extent of the site has not been entirely determined, but there is a strong possibility that large amounts of cultural materials in a relatively undisturbed context are present.

Topographic-Environmental Situation

The Lotterer site is located on the right bank of the Osage River floodplain and adjacent to the river. The floodplain is about 0.55 mile wide at this point and the site is about 0.45 mile from the bluff base. Steep bluffs rise above the river directly across from the site. About 55 percent of the land within a one-mile radius of the site is on the same side of the river as the site, and about 95 percent of the bottomland within one mile of the site is on the same side of the river. The ratio of bottomland to upland within one mile of the site and on the same side of the river is about 50:50.

The site is located in an open exposure on what appears to be a relatively high area on the floodplain. The present ground surface at the site is about 2.5 to 3 meters above the river at an elevation of about 640 feet amsl. The buried strata of the site are about 1 to 1.5 meters above the river. On either side of the site the present surface of the river bank drops about 0.5 to 1 meter. Behind the site the ground surface also drops to a series of extensive backswamps; then it rises to an older terrace about 300 meters wide. The terrace is at the foot of a moderately steep ridge which stands a little over 200 feet above the floodplain. The site is on the right bank of the river between the mouths of two first order streams, both of which are less than 100 meters from the site.

The site is on relatively high ground in this portion of the floodplain. Six major environmental zones are within one mile of the site on the same side of the river including the river, a well-drained floodplain terrace adjacent to the river, backswamps, an older terrace on the valley edge, a small stream valley, and rugged uplands.

CHAPTER XI

Artifact Description

The scope of work for the project calls for a "limited discussion of the recovered artifacts." A brief description of the various artifacts follows, and an inventory of all artifacts recovered is presented in Appendix II.

In order to retain consistency with previous and ongoing archaeological studies in the Truman Reservoir area and in the Ozarks in general, the classificatory system employed in this report follows recent typologies from the region. Descriptive categories are essentially based on those developed by James and Cynthia Price (C. Price 1980a; J. Price 1980), and an attempt has been made to make these categories consistent with the more specific descriptive categories developed by Reagan and Roper (Reagan 1979). Use/functional categories follow those of Ahler and McMillan (1976) and the Prices (C. Price 1980b), but the classifications in this report are based on macroscopic analysis of form, production technique and use wear rather than microscopic analysis.

Projectile Point/Knife

The projectile point/knife (pp/k) category is used in a somewhat more general sense than Ahler and McMillan's (1976:165-170) projectile point/hafted cutting tool category, since a detailed microscopic analysis of artifact wear patterns like theirs has not been attempted in this report. In this report the pp/k category includes artifacts that functioned solely as tips on projectiles including spears, darts, and arrows as well as artifacts which are virtually identical in size, form, and technical attributes but also served as cutting, sawing, scraping, cleaving, prying, reaming, engraving, and/or perforating tools.

The general attributes of the pp/k category follow Ahler and McMillan's definition of the morphological class, point, which "refers to any bifacially flaked, bilaterally symmetrical, chipped stone artifact exhibiting a point of juncture on one (distal) end and some facility (notching, constriction, lateral grinding) for hafting on the opposite (proximal) end" (Ahler and McMillan 1976:165). The small to medium size of the projectile points/knives from this survey, their high degree of symmetry, the fine edge retouch, and the presence of impact fractures suggest that, at least in part, these specimens were used as projectile points.

Two Cupp Corner Notched pp/k were found at 23BE1010, the Lotterer site. One (Figure 6a) conforms to the type definition (cf. Baerreis and Freeman 1960:52-54; Perino 1971:20), and the second has the basic Cupp outline and production technique, but the blade and base are relatively broad (Figure 6b). The Cupp type has been associated with the Late Archaic to Woodland periods (Purrrington 1971:112; Roper 1977b:51), but Chapman (1980:308) places it in the Late Woodland to Mississippian periods.

One Langtry Stemmed pp/k was found at the Lotterer site (Figure 6c). This pp/k conforms to the type definition (Suhm, Krieger, and Jelks 1954:438; Chapman 1980:309-310). The type is associated with Late Archaic and Woodland periods.

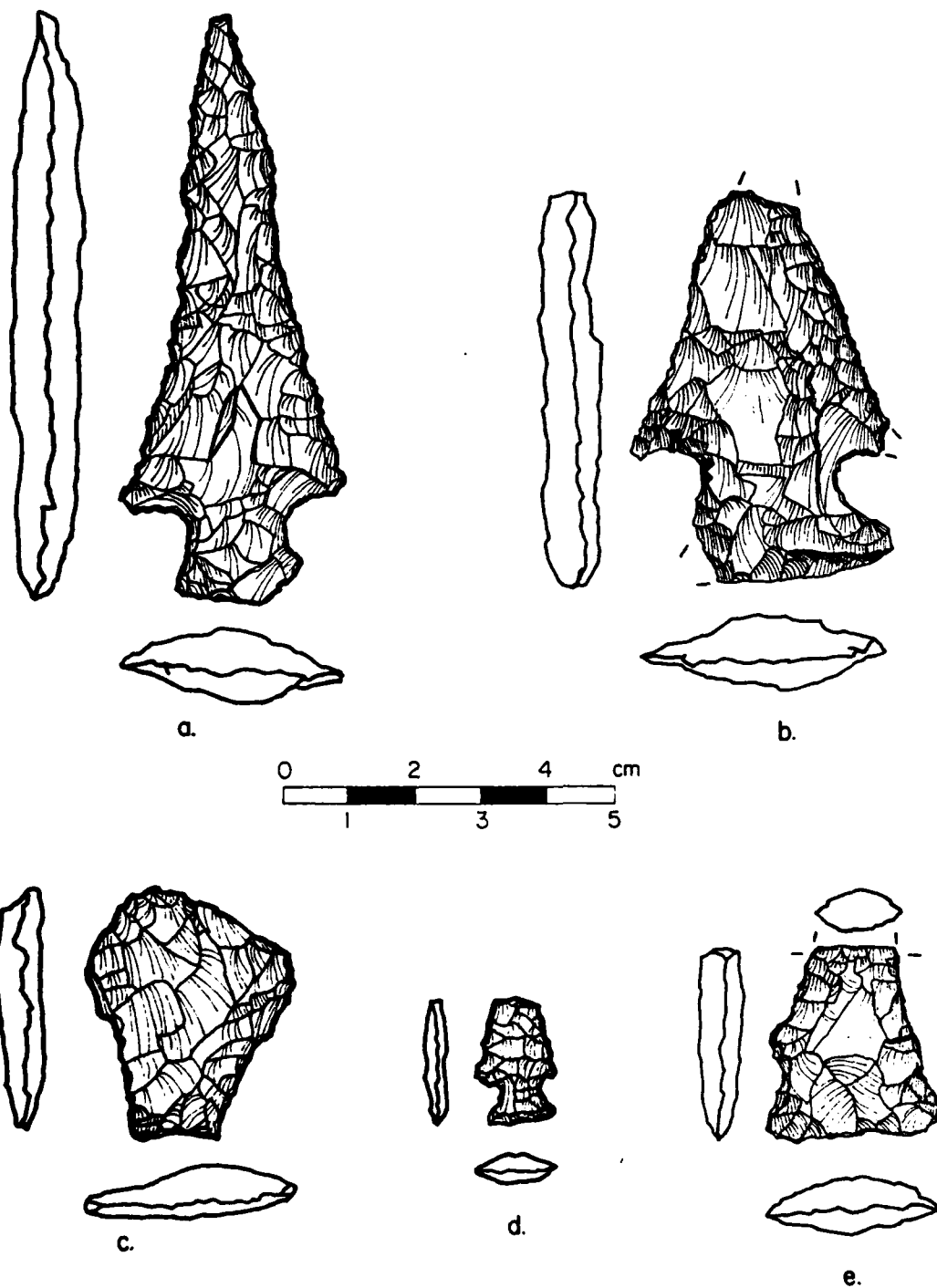


Figure 6. Projectile point/knives from Lotterer Site, 23BE1010. a-b, Cupp; c. Langtry; d. Scallorn; e. Rice Side Notched Variant (?).

A Scalloped Corner Notched arrow point was found at the Lotterer site (Figure 6d). The attributes of this point are typical (Suhm, Krieger, and Jelks 1954:506). In Southwest Missouri the type occurs in Late Woodland and Early Mississippi contexts (Chapman 1980:312).

A reworked pp/k was found in situ eroding out of the organic stratum about 1.75-2.00 meters below surface at the Lotterer site (Figure 6e). This artifact bears a superficial resemblance to the Rice Lobed type because basal thinning has produced a very slightly subconcave base and one of the basal corners is rounded. Moreover, the blade has been resharpened from alternate sides and hinging of pressure flakes on both sides gives the impression of alternate beveling. However, basal grinding is absent and the point most closely resembles possible variants of Rice Side Notched in the Truman Reservoir collections (Donna Roper and Susan Goldberg, personal communications). This artifact is tentatively assigned to the Late Woodland period (cf. Chapman 1980:311).

Two fragments of corner notched pp/k were found at the Lotterer site and 23BE1009, respectively (Figure 7a-b). The blades of these points are badly broken and they cannot be assigned to a stylistic class. However, both are deeply corner-notched and medium sized, grinding of basal and stem edges is absent, and the basal corners are pointed. The last attribute has been used to distinguish Woodland corner notched pp/k from Archaic corner notched pp/k (which generally have rounded basal corners) in the Ozarks of northeastern Oklahoma (Purrrington 1971:98), and a Woodland date is tentatively assigned to these two specimens.

Hafted Knife

Artifacts in this category bear some morphological resemblance to pp/k's but tend to be relatively large, are often asymmetrical, are less carefully retouched along the blade edges, thus producing a more sinuous working edge, and have "a high occurrence of transverse blade fractures and a near absence of impact fractures" (Ahler and McMillan 1976:170). One specimen from the Lotterer site fulfills these criteria. Its transversely broken blade has been reworked and it has a contracting, essentially Gary-like, stem (Figure 7c). In Missouri the Gary form is attributed to the Late Archaic through Woodland periods (Chapman 1980:308). The very similar Dickson Broad Blade form of Illinois is generally associated with the Woodland period (White 1963).

Generalized Biface

This category includes bifacially worked artifacts which lack a hafting element. In most cases generalized bifaces are at least roughly symmetrical. Observed in the collections from this project were four classes of generalized bifaces which fit general categories previously observed in collections from the central and eastern Ozarks (C. Price 1980a:105-111; J. Price and C. Price 1980). These general classes are based on morphological and general technical attributes, but the hypothesized use of each class will be discussed as well.

The four generalized biface classes include:

1. Thin bifaces with edge retouch. Cursory, macroscopic observation

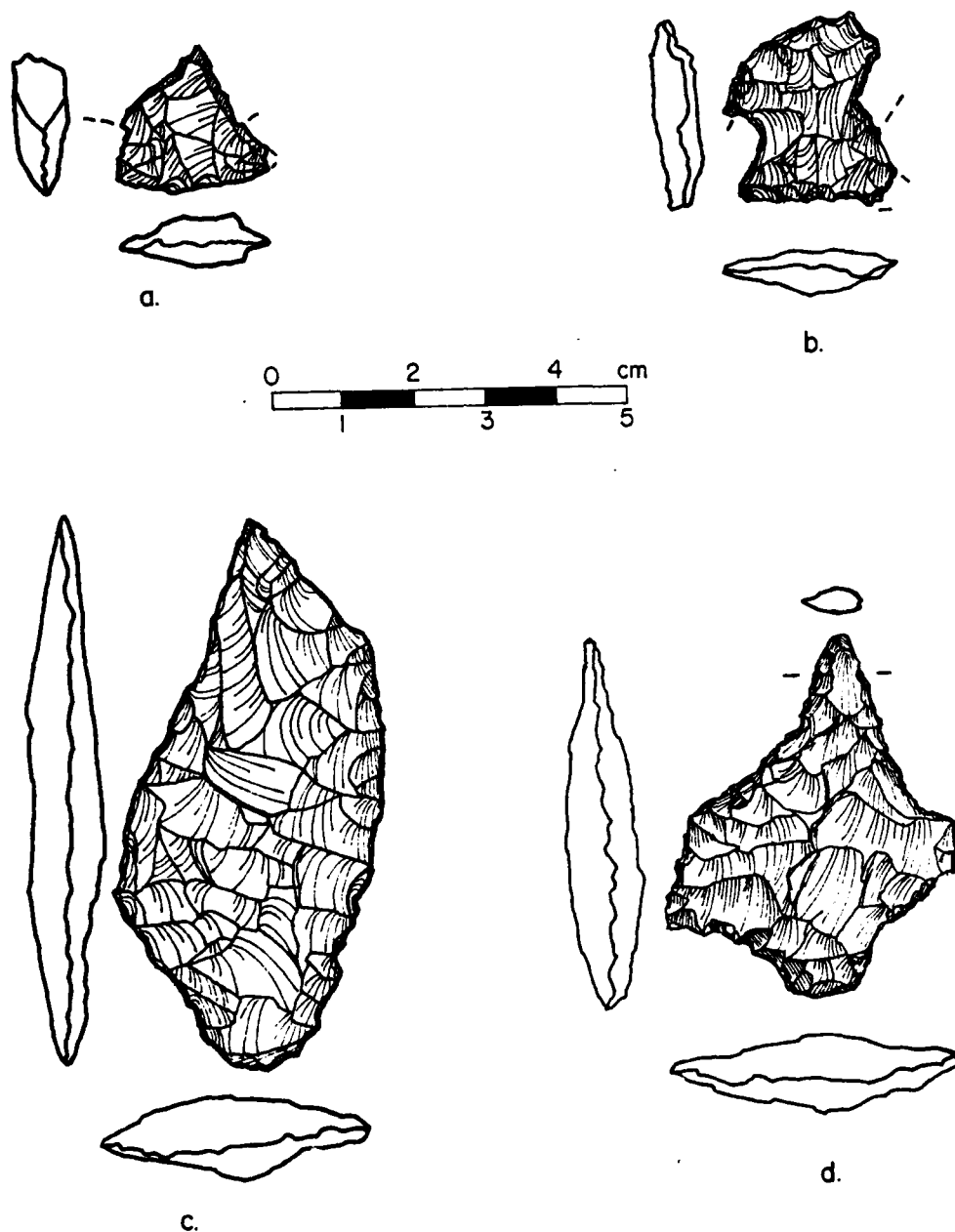


Figure 7. Hafted bifacial tools. a-b, Woodland Corner Notched pp/k (23BE1010, 23BE1009); c. Hafted contracting stemmed knife (23BE1010; d. Perforator on reworked Gary pp/k.

of blade edges noted frequent grinding and flaking. These artifacts probably were used as light duty cutting or cutting/scrapping implements. Thin bifaces may also represent preforms, in which case they should be expected to exhibit relatively little edge retouch or use-wear and frequently show some evidence, such as extensive step fracturing, to indicate why tool production was terminated.

2. Thick biface with edge retouch. Grinding and flaking of the edges of these artifacts are often superficially evident, and they may have been used as heavy duty cutting tools (Figure 8a).
3. Thick biface with no edge retouch. These artifacts show little or no edge wear with the exception of occasional localized edge grinding possibly in preparation for removal of a thinning flake. These artifacts are believed to be intermediate stage preforms (Figure 8b).
4. Very thick biface with no edge retouch. These artifacts show little, if any, evidence of use wear; hinge fractures are common; and often small areas of cortex remain on unfinished faces or edges. They are interpreted to be aborted preforms in an early stage of manufacture (Figures 8c, 9a, b).

Thick biface fragments are also included in the generalized biface category.

Thin and Indeterminate Biface Fragments

Thin biface fragments may be light duty knife, preform, or pp/k fragments, and indeterminate biface fragments include an even wider range of categories. Therefore, these specimens are classed separately.

Denticulate

Reagan (1979) defines a denticulate as "a lithic artifact with two or more tooth-like projections caused by snapping off of the distal or lateral margins." The denticulate from the Lotterer site is a unifacially retouched interior flake with an uneven, coarsely serrated working edge (Figure 9c).

Thick, Steeply Beveled End Scraper

These implements conform very closely to Ahler and McMillan's transverse scraper/grinders which "are relatively long and narrow bifacial tools with a transversely oriented working edge at one or both ends . . . characterized by an extremely steep angle (ca. 90°) and pronounced use-wear in the form of faceting, rounding, grinding, and striations" (Ahler and McMillan 1976:175). The major difference in the specimens from this survey is that about half are unifacial and irregular in outline (Figure 10b-d).

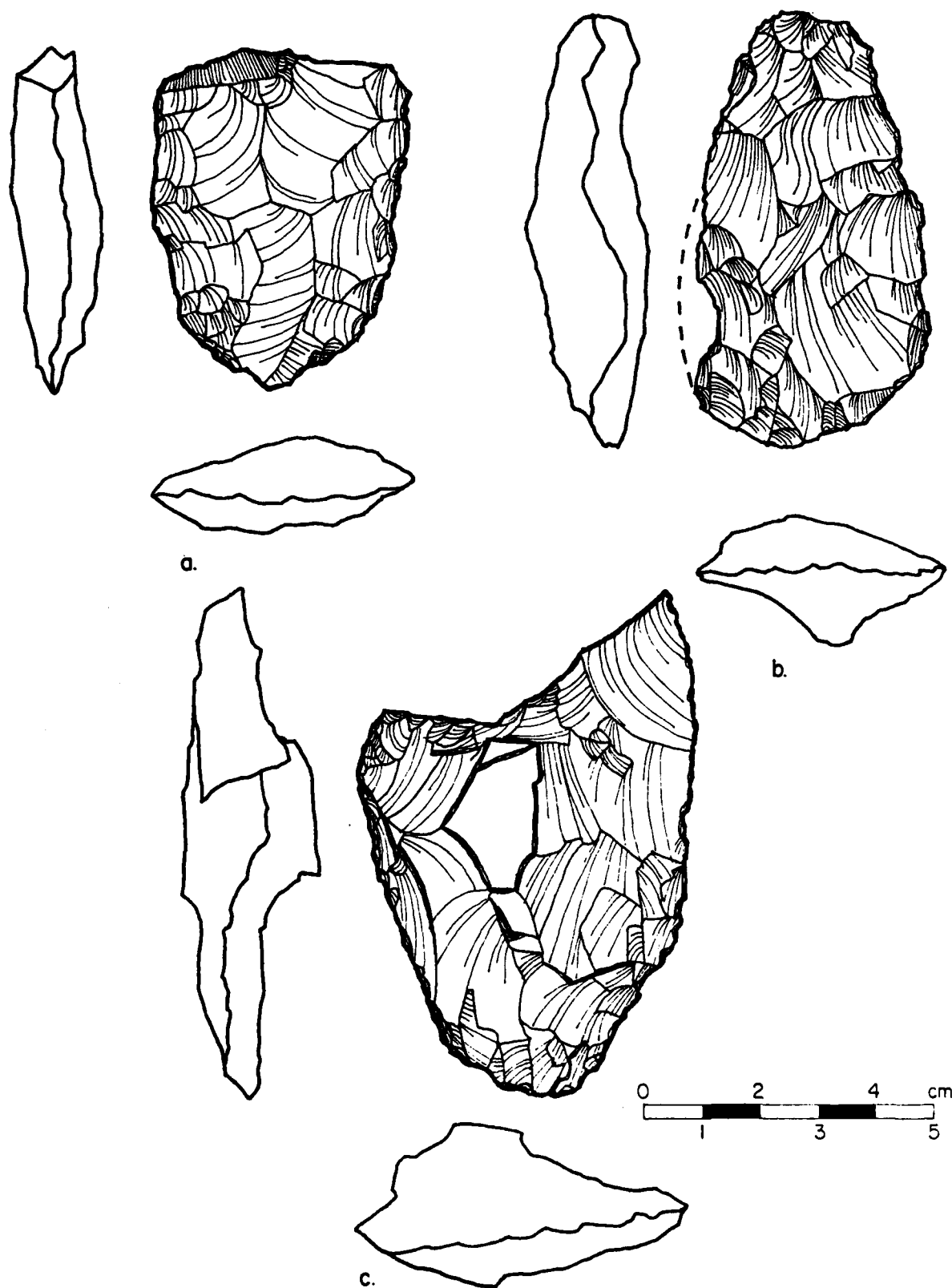


Figure 8. Bifaces from the Lotterer Site, 23BE1010.
 a. Thick biface with retouch (heavy duty knife)
 b. Thick biface without retouch (preform)
 c. Very thick biface (aborted preform)

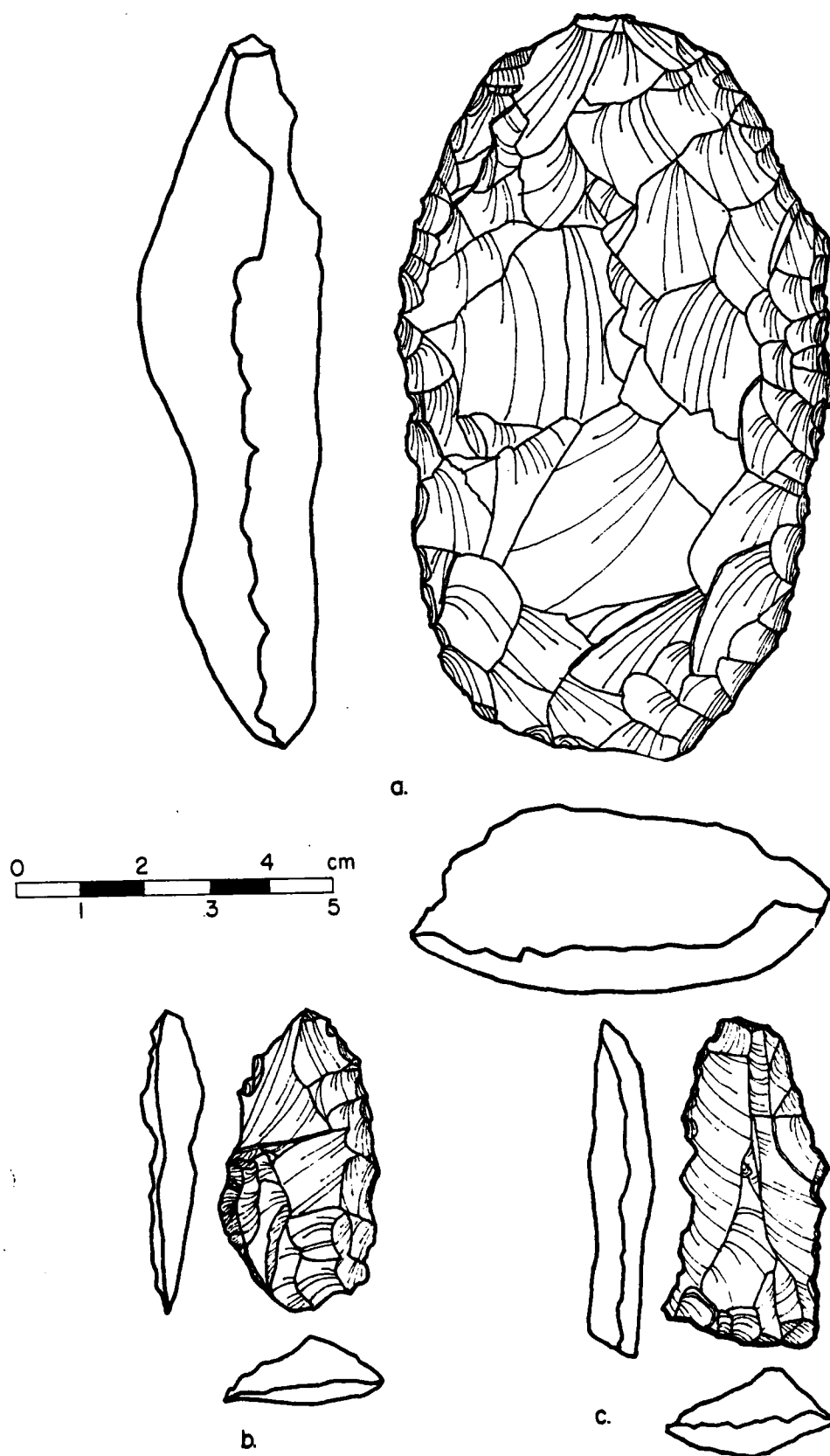


Figure 9. Aborted preforms and denticulate from Lotterer Site, 23BE1010.

a. Large aborted preform; b. Small aborted preform;
c. Denticulate (dorsal face up).

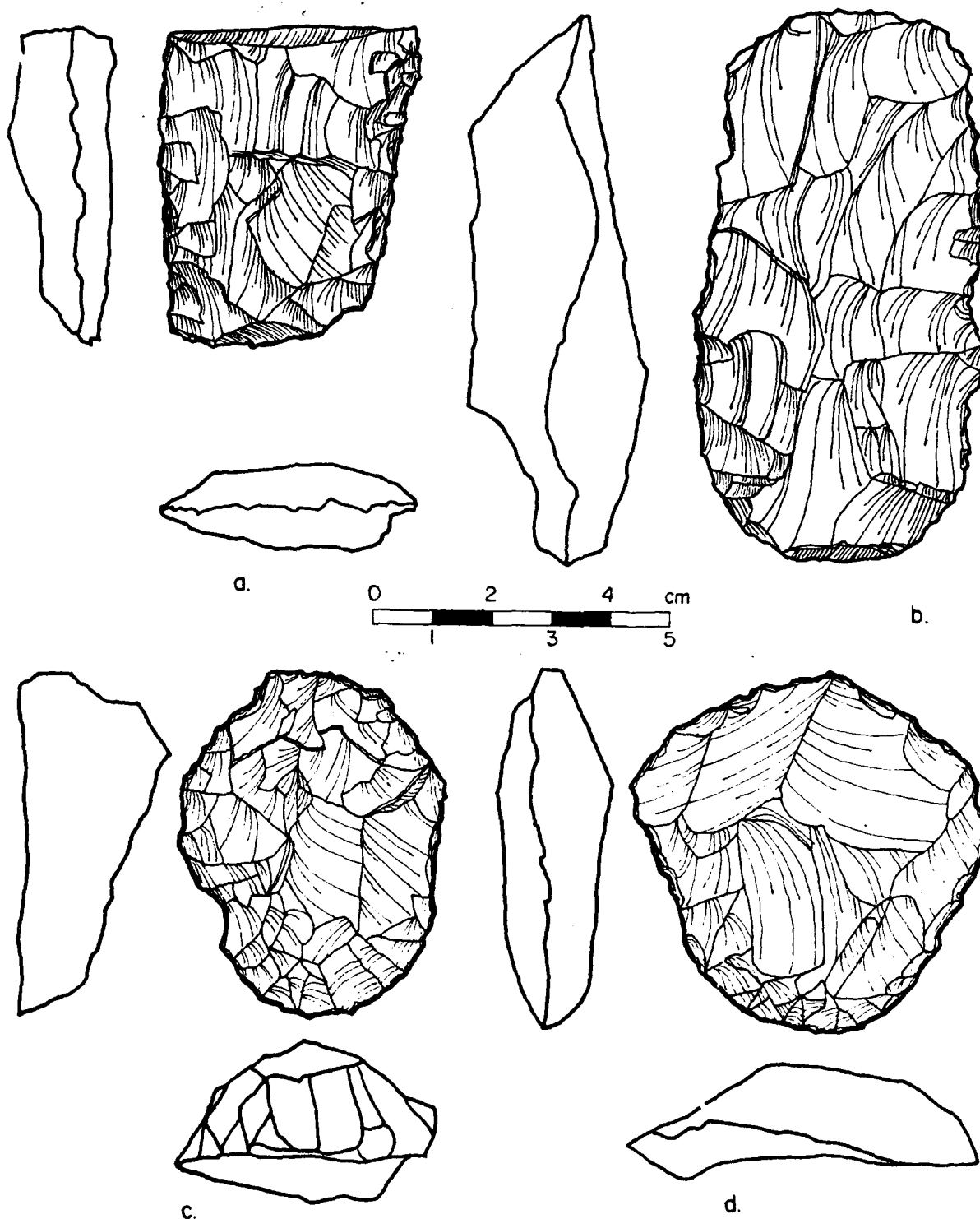


Figure 10. Digging tool and thick, steeply beveled end scrapers from the Lotterer Site, 23BE1010.
 a. Digging tool (polish on lowest third of face;
 b. Thick, steeply beveled end scraper - bifacial (dorsal side up); c-d, Thick, steeply beveled end scrapers - unifacial.

Irregular Scrapers

This is a general category which includes all flakes, chert fragments, or bifaces with a unifacially worked, beveled edge, and which lack any obvious provision for hafting (Ahler and McMillan 1976:175). The specimens from the Below Truman Survey which have been placed in this class include any unhafted scraper with an irregular outline whose bit shows evidence of apparently intentional retouch. Irregular scrapers in this sample were produced on decortication and interior flakes (Appendix IV).

Utilized Flake Scrapers

This category consists of flakes which have one or more edges that have been modified by the unifacial removal of tiny pressure flakes. The flakes have not been shaped nor has a working edge been prepared by intentional retouch. All categories of flakes from the sample were utilized as scrapers although interior flakes appear to have been preferred at 23BE1008 and secondary decortication flakes are most common at 23BE1009 and 23BE1010 (Appendix IV). No utilized angular fragments were noted in the sample.

Spokeshave Scraper

One interior flake from 23BE1010 has a notch which has been unifacially retouched and utilized. The flake is otherwise unmodified.

Chopper

Choppers have low to medium-angled working edges which have been crushed and often step-fractured as a result of hard blows against relatively tough material. Choppers and heavy duty cutting tools often grade into each other, but choppers generally show relatively little preparation of the general outline or the working edge. The three choppers identified in the sample include a thick, irregular biface from the Lotterer site and a modified core and a large, modified, interior flake from 23BE1008.

Perforator, Reworked PP/K

The blade of a pp/k from 23BE1010, with a slightly contracting stem, possibly a Gary variant, has been bifacially retouched to form a long, tapered, sharply pointed bit (Figure 7d).

Perforator, Unprepared Flake

An interior flake from 23BE1008 has a long, sharp, unmodified point which has several tiny flake scars concentrated near its tip.

Polished Biface (Digging Tool?)

A thin, relatively narrow symmetrical biface from the Lotterer site shows

moderately heavy polish on one face (Figure 10a). One end is broad and straight (the other has been broken off) but no unusual wear or polishing is macroscopically apparent on its edge.

Combination Tools

Three irregular flake scrapers and one utilized flake scraper were used for at least one purpose other than scraping. One irregular flake scraper and the utilized flake scraper have a long edge which shows continuous dulling, presumably from use as a cutting tool and they are classed as knife/scrapers. One irregular flake scraper has a small spur on one edge which has been formed by removal of single pressure flakes from either side, and a second irregular flake scraper has a unifacially worked bit with a squared tip; both tips show a concentrated removal of tiny flakes and possibly some polish and they are interpreted as a graver tip (scraper/graver) and a reamer tip (scraper/reamer), respectively.

Tested Cobble

A cobble from the Lotterer site has had a small number of decortication flakes removed, apparently to determine the quality of the stone.

Core

Nine chert cores of various sizes and at various stages of reduction were found at the Lotterer site. Some were cobbles, often retaining some cortex, which were bifacially reduced. Others were large flakes with tabular outlines from which several large percussion flakes had been randomly removed.

Exhausted Core

Two cores from 23BE1008 and 10 from the Lotterer site had been reduced to the point that no functional flakes could be struck from them nor could they be converted into a functional artifact.

Blade Core

A roughly conical chert core from the Lotterer site has had several long narrow flakes removed. These flakes are parallel to each other and perpendicular to the flat platform of the core (Figure 11a). A small number of blade-like flakes were found at three sites in the project/survey area (Appendix II) and some may be the results of a specialized blade-producing technique. A blade technology is a Middle Woodland characteristic in the Midwestern United States (White 1963).

Flakes

The non-utilized flakes from the survey collection were grouped in five

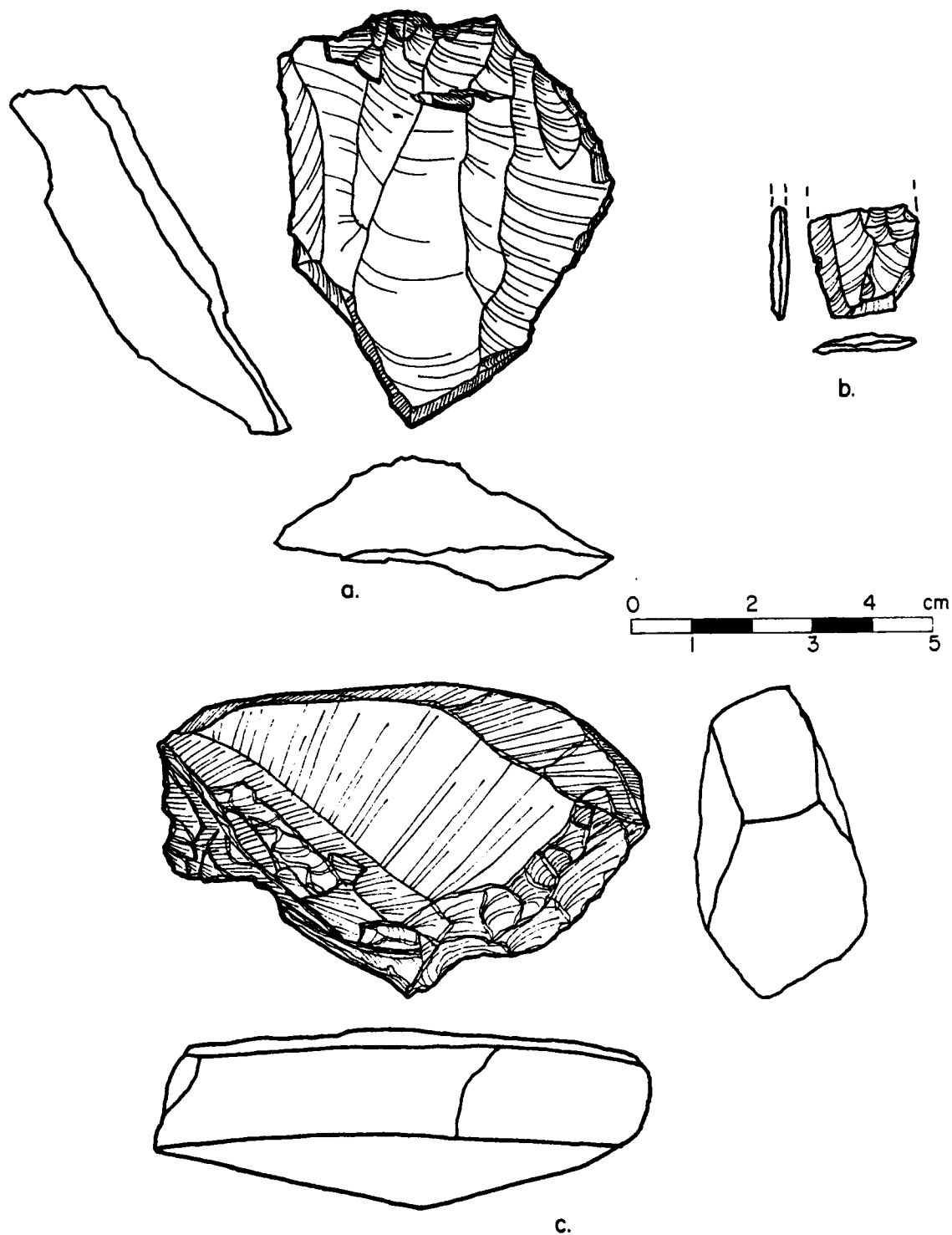


Figure 11. Blade core, blade flake and rubbed hematite from Lotterer Site, 23BE1010.
 a. Blade core; b. blade flake;
 c. Rubbed and faceted hematite.

categories. Primary decortication flakes have one face entirely covered by cortex and secondary decortication flakes have cortex on a portion of a face (White 1963:5). Blade-like flakes from the Below Truman sample are proportionately long and narrow (length:width ratio 2:1 or greater) and generally have long, narrow flake scars on their dorsal face which roughly parallel the long axis of the flake (Figure 11b). Biface thinning flakes have multiple flake scars on the dorsal face and an identifiable portion of the original biface edge on the striking platform (Reagan 1979). The platform angle is relatively low. Interior flakes include all other flakes which do not fit into the classes just described.

Angular Fragments

A relatively small number of angular chert fragments was found at the sites. These irregular shatter pieces can be the result of aboriginal stone working, natural geomorphic or climatic processes, or modern human activities, but the small number of such pieces at the sites and the lack of evidence of water rolling suggests that they are part of the archaeological assemblage, and they have been included in the artifact total.

Mano

Manos are cobbles or pebbles which were used as hand-held, crushing/grinding implements. The criteria for identifying manos in this study are those of Winters (1969:61) which include: 1) battered ends or edges; 2) uniform breaking or erosion of the patina over the entirety of a flat or slightly convex surface; 3) erosion of the edges of minute, natural pits on the same surfaces, so that the edges become square rather than rounded as they are in the natural state; and 4) occasional striations which have developed on the mano surface from abrasion against a metate or other lower grinding element. The first three criteria apply to a well-formed mano from the Lotterer site (Figure 12).

Pestle

Pestles are pounding/grinding tools which have working surfaces which are small relative to manos. A sandstone cobble from the Lotterer site with a trianguloid outline was heavily battered and consequently truncated on one end. The working surface was relatively flat, but the cobble was otherwise unmodified (Figure 13).

Anvil

A sandstone cobble from the Lotterer site has a shallow, irregular, pecked depression on one face which suggests use as a platform for a pounding or hammering activity.

Shaped Cobble Fragment

A sandstone cobble fragment from the Lotterer site has continuous pecking along its edge but it is too fragmentary to identify further.

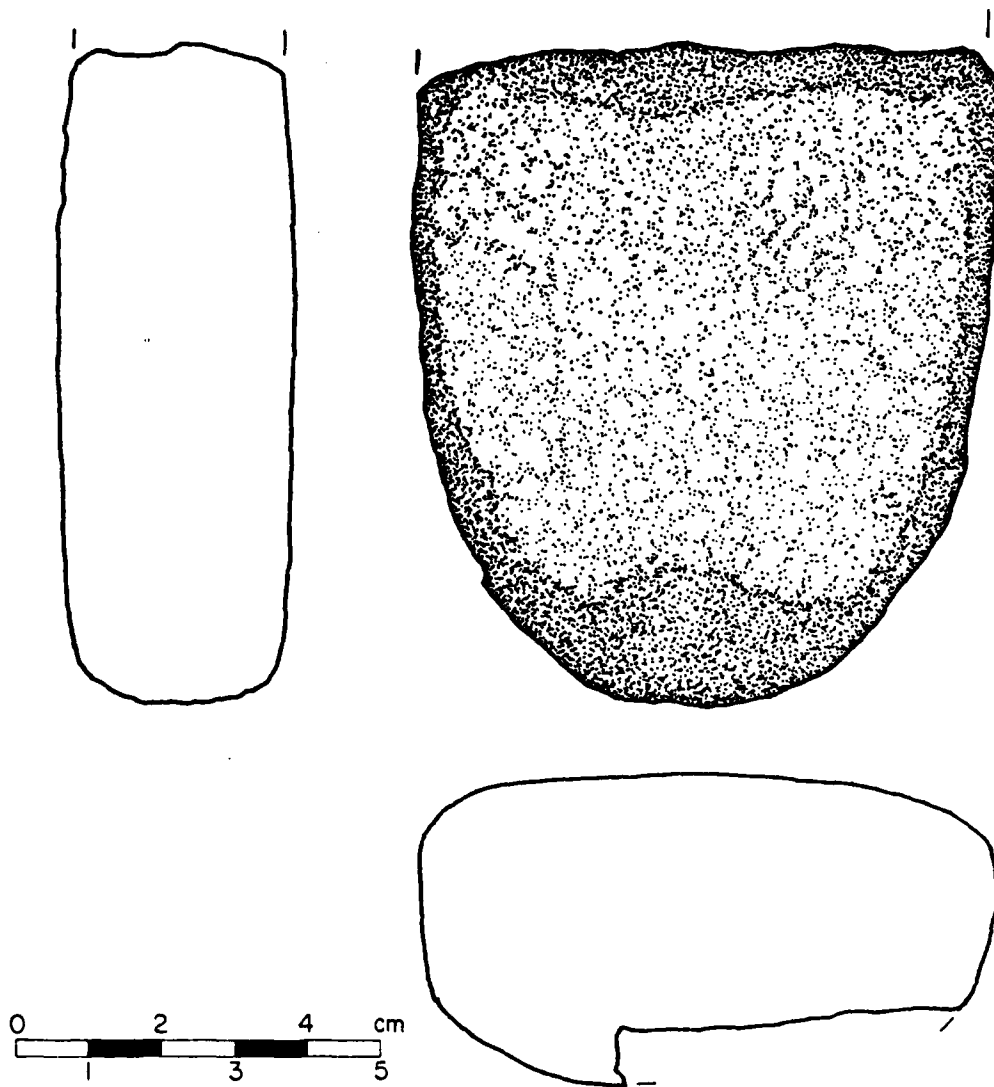


Figure 12. Mano from the Lotterer Site, 23BE1010.

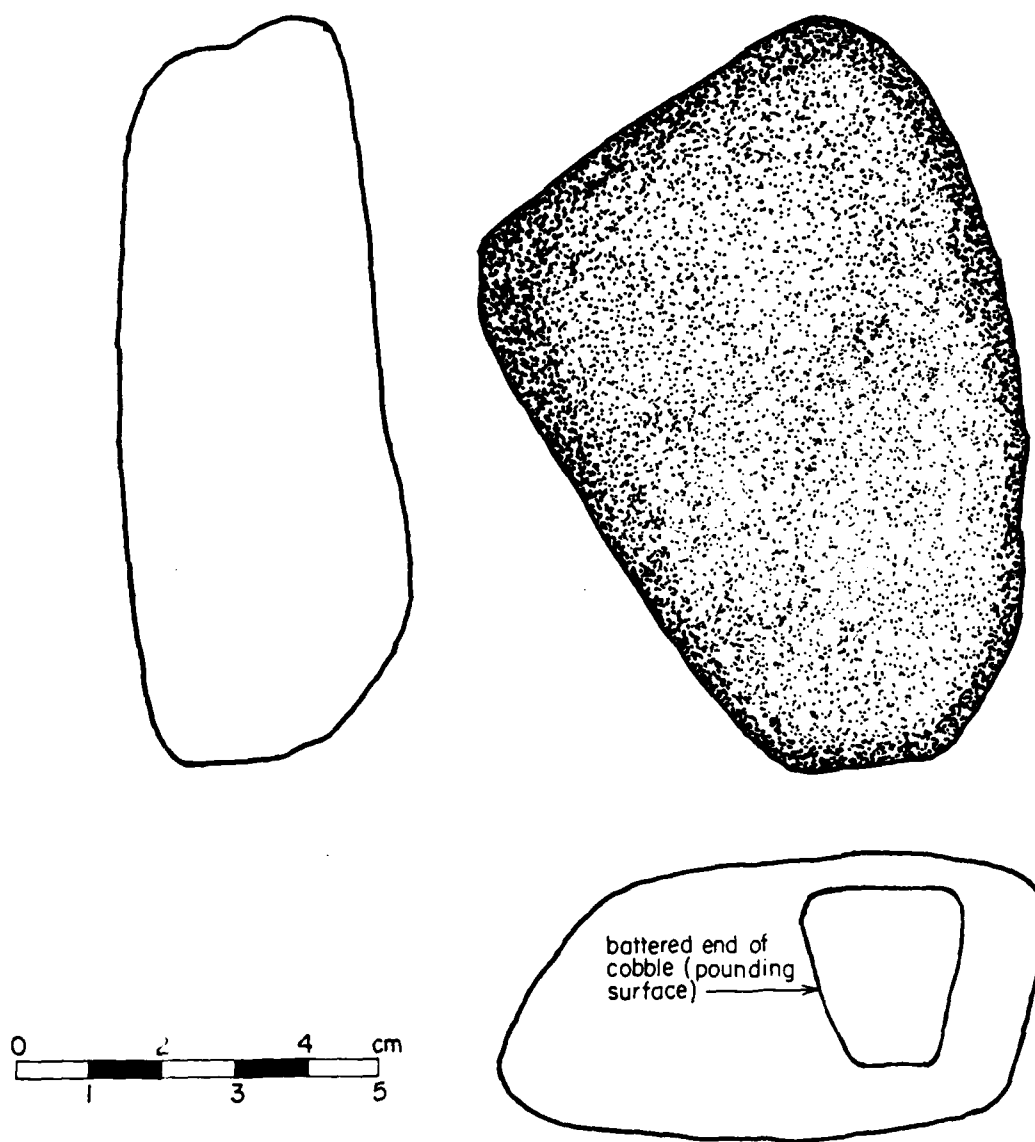


Figure 13. Unshaped pestle from Lotterer Site,
23BE1010.

Rubbed Hematite

Three pieces of dark red hematite with one or more faces ground and faceted were found at the Lotterer site. One of the pieces is relatively large (Figure 11c). These items have been interpreted as "residue from processing larger pieces into red ochre" (Ahler and McMillan 1976:189). Rubbed hematite and the activity of pigment processing were found to be significant occurrences in Middle Archaic strata at the Rodgers shelter (Ahler and McMillan 1976:190; McMillan 1976b:220, 225) while this activity was negatively correlated with Late Archaic and Woodland strata at the site (McMillan 1976b:220). However, rubbed hematite is also associated with burial cairns dating to about A.D. 400-900 in the Pomme de Terre Valley (Chapman 1980:98).

Fossils

One fragment of fossilized crinoid stem and a cobble teeming with crinoid and shellfish fossils were found at the Lotterer site. These items may have been naturally deposited at the site or they may have been collected by the site's occupants.

Prehistoric Ceramics

One sherd of limestone-tempered, plain-surface pottery was found eroding from the deposits at the Lotterer site about 1.75 to 2.0 meters below the surface of the terrace. The sherd is relatively thin (ca. 4 mm), heavily oxidized, and has homogenous, fine, angular temper which has been completely leached out. The attributes of the sherd are consistent with those of the limestone-tempered ceramics of the Lindley phase of the Pomme de Terre area (Wood 1961; Chapman 1980:92-93; Roper, personal communication).

Historic Ceramics

Four historic whiteware ceramics were found on the surface at three of the sites in the project/survey area. Their infrequent occurrence suggests that they represent isolated occurrences rather than potentially significant historic sites or features.

Thermally Fractured Rock

Rock fragments exhibiting potlid spalling, vitreous surfaces, and/or oxidation were found at 23BE1008 and the Lotterer site. Although these remains may represent aboriginal heat treating or fires, they may also be the result of recent fires and/or frost action, however, they are included in the artifact totals.

CHAPTER XII

Cultural-Temporal Affiliation of Sites

The identification of archaeological cultures present at the sites in the project/survey areas and the periods of time when these sites were occupied is based on diagnostic artifacts found at the sites. These cultural-chronological types have been defined in a number of earlier studies referred to in the preceding chapter on Artifact Description. Such artifact classes are dynamic and always subject to revision, and the definitions, descriptions and temporal ranges of many of these types will be refined in Donna Roper and Susan Goldberg's chapter on projectile point typology in a forthcoming draft report on the Truman Reservoir Survey. It should be emphasized that the cultural-temporal affiliations assigned to the sites in the project/survey areas are by no means final. Subsequent investigation of these sites may recover new data which would extend the period of occupation of a site, and refined typologies may revise it.

Only six artifacts were found at the Gaylord Pasture site, 23BE1007, and none is diagnostic. This site cannot be associated with a prehistoric culture or period at this time.

No diagnostic artifacts were found at the Kowertz site, 23BE1008, but the artifact content and topographic setting of the site are typical of many Late Woodland sites noted by Roper (personal communication) in the Truman Reservoir area. These sites, like the Kowertz site, are sparse lithic scatters generally located near a major body of water. The majority of cultural items found at these sites are flakes, and the occasional pp/k is almost always a Scallorn, a typical Late Woodland arrowpoint.

The Barry site, 23BE1009, had been previously picked over by collectors, but one badly broken corner notched pp/k, with attributes that correspond most closely with such Middle Woodland types as Cooper and Steuben, was found by the survey crew.

Diagnostic artifacts from the Lotterer site, 23BE1010, include such pp/k types as Cupp (2 specimens), Langtry, Scallorn, a possible variant of Rice Side Notched, and a corner-notched fragment with Middle Woodland attributes.

Other diagnostic artifacts from the site include a hafted knife with a Gary-like form, a Gary-like pp/k reworked as a perforator, a blade core, 3 pieces of ground and faceted hematite, and a limestone-tempered, plain-surfaced sherd attributed to the Lindley phase. Although some of these artifact classes may appear as early as the Late Archaic, and rubbed hematite is abundant in some Middle Archaic horizons, all of them are found in Middle Woodland and/or Late Woodland horizons and some occur exclusively in those horizons. It is clear that a major Middle-Late Woodland occupation is represented at the Lotterer site, and the site, or at least portions of it, may be exclusively Woodland.

The preliminary evidence from the four sites located by this survey suggest extensive occupation of this portion of the Osage River Valley during the Middle and Late Woodland periods. Further investigation will be necessary to determine if the project area was occupied during other periods.

CHAPTER XIII

Site Function

Interpretation of Site Function

Any assessment of past activities conducted at an archaeological site and the role of that site in local and regional subsistence, settlement, and sociocultural systems (site function) must be preliminary and tentative. Often resurvey and/or excavation of a site will produce new data leading to the identification of previously unrecognized activities (cf. C. Price 1980a:144, 1980b:578) and in some cases a reinterpretation of site function.

Identification of past activities and interpretation of site function are limited by the selective preservation of cultural remains at most archaeological sites, the frequent mixing of remains from different cultural periods, and the fact that data recovery programs which are limited by temporal and/or financial constraints often fail to produce a representative sample of archaeological remains from a site. The following interpretations are hypothetical and, when appropriate, should be subjected to testing by further investigation of the sites.

The artifact classes described in the chapter on Artifact Description are rather loosely defined use categories. The descriptive attributes of these categories and the inferred uses and activities are presented in Table 1. The artifacts and features used to identify particular activity sets are listed in Table 2. These classes are slightly modified versions (Table 1 more so than Table 2) of those developed by Cynthia and James Price for the Eastern Ozark/Western Lowland of Southeast Missouri (cf. C. Price 1980b: Tables 12-2 and 12-3). The development of the descriptive/use classes in this report has also been influenced by the work of Ahler and McMillan (1976), House (1975), and Winters (1969).

Site function is defined not only by the use classes of artifacts present at a site and the activity sets represented by particular classes of artifacts and features, but by the topographic-environmental setting, artifact density, and presence or absence of a dark organic midden as well. By using as broad a data base as possible it can be seen that Klinger's (1978) dichotomous model of site types which consists of base settlements where maintenance tasks were performed and specific activity loci where extractive tasks were performed, while extremely useful, is an oversimplification in some instances. For example, Cynthia Price and James Price have observed that many sites in the Eleven Point River and Fourche Creek valleys in the Eastern Ozarks, which would normally be classed as base settlements because their artifact assemblages include a wide range of use categories, in fact, represent more ephemeral occupations since no features (structural remains, post molds, pits, hearths, or burials) or evidence of midden are found at these sites (C. Price 1980a:148-151, 1980b:578). Only a small number of Eastern Ozark sites have features and midden as well as functionally diverse artifact assemblages which would suggest a base settlement. Future study of the project area should include testing of the Klinger and Price models.

The initial stage of artifact analysis for this report consisted of grouping the artifacts in descriptive classes, each of which is based on attributes of form, production technique, and use-wear. Each descriptive class has also been assigned to a category referring to its inferred general use, and the activity or activities attributed to each use class are noted

Table 1

Inferred Uses of Prehistoric Artifacts from the Missouri Ozarks
(modified after J. Price and C. Price 1980:Table 12-3)

<u>Descriptive Class</u>	<u>Use Class</u>	<u>Use/Activity</u>
Projectile point/knife	Projectile point/knife	Projectile (spear, dart, arrow), cutting, sawing
Hafted knife	Hafted knife	Cutting, sawing, light chopping
Thin biface, edge retouch	Generalized knife	Cutting, sawing, light chopping, final stage preform
Thin biface, little or no edge retouch	Thin preform	Preform, sawing, light chopping, cutting
Thick biface, edge retouch	Heavy duty knife	Cutting, chopping, sawing, preform
Thick biface, little or no edge retouch	Thick preform	Preform, chopping, sawing
Thick biface, with extensive hinge fracturing and/or irregular cross-section	Aborted preform	Preform, chopping
Unmodified flake with bifacial edge wear and/or blunted edge	Utilized flake knife	Light duty cutting and slicing
Thick biface/uniface with battered edges	Chopper	Chopping
Flake with deeply serrated edges	Denticulate	Cutting and slicing, sawing, shredding
Thick biface/uniface with beveled, unifacially worn edge	Heavy duty scraper	Heavy duty woodworking
Thin biface/uniface with beveled, unifacially worn edge	Light duty scraper	Hide preparation, bone and woodworking
Unmodified flake or angular fragment with unifacially worn edge	Utilized flake scraper	Light duty scraping, whittling
Flake with worked and/or unifacially worn concave edge	Spokeshave scraper	Wood or bone shaft scraping and smoothing
Tool with bifacially worked bit	Drill or perforator	Drilling, piercing

Table 1 (continued)

<u>Descriptive Class</u>	<u>Use Class</u>	<u>Use/Activity</u>
Tool with broad, unifacially worked and worn bit	Reamer	Reaming, grooving
Tool with narrow spur showing use wear	Graver	Scoring, graving, bone and woodworking
Biface or uniface with generally asymmetrical longitudinal cross section and unifacial polish on bit	Adze	Heavy duty woodworking; manufacture of concave wooden objects
Biface with generally symmetrical longitudinal cross section and unifacial or nearly unifacial polish	Digging tool	Excavation of storage, refuse, structural and burial facilities; digging roots
Cobble, pebble, or core with extensive battering	Hammerstone	Lithic working, pounding, cracking bone and nuts
Cobble or stone slab with irregular pitting	Anvil	Anvil for bipolar core reduction, lithic working
Cobble or stone slab with deep, regular pitting	Nutstone	Uncertain function, possibly nut processing
Irregular cobble with grinding	Ground cobble	Grinding, smoothing, hideworking, lithic tool working (biface and core platform edge preparation), plant food processing
Shaped cobble with grinding	Mano	Plant food processing, pigment processing
Stone slab with shallow depression	Metate	Plant food processing, pigment processing
Stone slab with deep depression	Mortar	Plant food processing
Irregular or shaped stone with small ground and/or battered surface	Pestle	Plant food processing
Very thick, irregular biface, nonutilized	Irregular core	Manufacture of flake and core tools (raw material); may be used for cutting, chopping, hammering and scraping
Thick biface or uniface with parallel, longitudinal flake scars, nonutilized	Blade core	Manufacture of specialized flake tools (raw material; may be used for cutting, chopping, hammering, and scraping

Table 1 (continued)

<u>Descriptive Class</u>	<u>Use Class</u>	<u>Use/Activity</u>
Very small, thick, irregular biface, nonutilized	Exhausted core	Final stage manufacture of flake tools (raw material); may be used for hammering
Cobble with flakes removed	Tested cobble	Initial stage of lithic tool manufacture; may be used for hammering
Primary decortication flakes, nonutilized	Same as descriptive class	Primary lithic reduction (raw material) and testing of cobbles (by-product)
Secondary decortication flakes, nonutilized	Same as descriptive class	Primary and secondary lithic reduction (by-product)
Interior flakes, nonutilized	Same as descriptive class	Primary and secondary lithic reduction and tool maintenance (sharpening)
Biface thinning flakes, nonutilized	Same as descriptive class	Tool maintenance and secondary lithic reduction
Blade-like flakes, nonutilized	Same as descriptive class	Secondary lithic reduction and tool maintenance, possibly specialized flake manufacture
Angular fragments, nonutilized	Same as descriptive class	Primary and secondary lithic reduction, may also be by-product of weathering and other natural or artificial forces
Burned, fire-cracked, and thermally fractured chert; burned limestone and cobbles	Thermally fractured rock	Hearthstones, earthovens, stone-boiling; cooking, food processing, heat treating of chert (lithic tool production by-product); may also be by-product of weathering and natural fires
Ground hematite, limonite, galena	Pigment stone	Pigment preparation
Unmodified sandstone, chert cobbles, hematite, limonite, galena, fossils	Lithic raw materials	Raw material curation
Ceramic sherd or vessel	Ceramic vessel	Cooking, food or water storage and/or transportation

Table 2

Sets of Artifacts and Cultural Features Evidencing
Particular Activity Sets in the Missouri Ozarks
(modified after J. Price and C. Price 1980:Table 12-3)

<u>Activity Set</u>	<u>Selected Artifacts and Cultural Features</u>
Hunting	Spear, dart and arrow points, atlatl weights
Butchering	Projectile point/knives; hafted, generalized, flake, and heavy duty knives; denticulates; choppers; hammerstones; cut and split bone
Hide working	Light-duty and utilized flake scrapers, ground cobbles, perforators, tanning pits
Wood-bone working	Light-duty and utilized flake scrapers, spokeshaves, drill/perforators, gravers, reamers, abraders, burins, chisels, worked bone
Heavy woodworking	Heavy-duty scrapers, adzes, axes, celts
Digging	Digging tools, storage and refuse pits, burials, post-molds and other subsurface structural features, fire basins, earth ovens
Primary stage lithic tool production	Tested cobbles, primary and secondary decortication flakes, interior flakes, irregular cores, aborted preforms, hammerstones, nonutilized angular fragments, burned chert cobbles and cobble fragments, anvil stones
Secondary stage lithic tool production	Nonutilized secondary decortication, interior, biface thinning and blade-like flakes; irregular and exhausted cores; thick and thin preforms; anvil stones; angular fragments, heat-treated flakes and angular fragments; hammerstones; ground cobbles, anvil stones
Specialized lithic tool production	Blade cores, blades and blade-like flakes, ground cobbles
Lithic tool maintenance	Biface thinning, interior, and blade-like flakes, ground cobbles, hammerstones
Plant food grinding and cracking	Mortars, pestles, manos, metates, "nutstones?" hammerstones?
Plant and/or meat food cutting and dicing	Choppers; hafted, generalized, and flake knives; denticulates
Processing of coarse plant products	Heavy-duty scrapers (?), lithic tools with silica sheen

Table 2 (continued)

<u>Activity Set</u>	<u>Selected Artifacts and Cultural Features</u>
Cooking and heating	Burned and fire-cracked rock, hearths, fire pits, earth ovens, ceramic containers (later cultural stages)
Storage	Pits, ceramic containers (later cultural stages)
Habitation	Post molds and other evidence of structures; features related to storage, cooking, and/or heating
Raw material curation	Unmodified chert cobbles, sandstone, hematite, limonite, galena, and/or fossils out of natural depositional context or in cache or burial
Pigment processing	Ground hematite, limonite, and galena; grinding stones with pigment residue

(Table 1). The artifact assemblages from each site have been ordered on an index of variability scale which the Prices applied to the prehistoric archaeological material from survey and test excavations in the Fourche Creek watershed (C. Price 1980b). The indices of variability of the assemblages from the Below Truman Survey were determined by dividing the total number of use classes of artifacts at each site by a base figure--the total number of use classes at all known sites in the project/survey area. The use classes listed in the second column in Table 1 and present in the collections from one or more sites in the project/survey areas (Appendix II) provided the base figure of 33 for the analysis on this report. These classes are listed in Table 3 and presence/absence of these classes and artifact indices for each site in the project area are shown.

Site Activities and Function

The Gaylord Pasture site, 23BE1007, has a low activity index of 0.1212. The site appears to be a very light (low artifact density) and extensive lithic scatter which is located on the edge of an older terrace just above the Osage River backswamps and floodplain. Based on present information the site is interpreted as a limited activity site which was infrequently occupied for short periods of time. The location of the site suggests that it may have been occupied during a season with relatively high flood potential and/or for the purpose of exploiting backswamp resources from relatively high ground. In addition, the intermittent stream beside the site would be most likely to be an active source of fresh water during a relatively rainy period. The most likely season at which high water conditions would prevail would be spring.

The Kowertz site, 23BE1008, has an activity index of 0.4242 which falls in the intermediate range (C. Price 1980b: Figure 12-1). This light-to-moderate lithic scatter is located on a relatively high area of the floodplain beside the Osage River. The site is similar in topographic-environmental setting and artifact density and content to a number of sites noted in the Truman Reservoir by Roper (personal communication) and discussed in the preceding chapter. Although the number of use classes at the site (14) may be relatively large for this site type, a limited range of activities appears to be represented. Artifacts related to heavy duty and light duty scraping, chopping, and primary and secondary stage lithic tool production are well represented while hunting/butchering and plant processing are underrepresented (Table 3; Appendix II). No midden stains or features were evident in the exposed river bank. The site is interpreted as a limited activity site where preparation of artifacts of stone and quite possibly bone, wood, and/or hides was a major activity.

The Barry site, 23BE1009, has the same intermediate-level activity index (0.4242) as 23BE1008. However, there are substantial differences between the artifact assemblages from the two sites since 23BE1009 lacks heavy duty knives, scrapers, and choppers, shows less emphasis on primary stage lithic workmanship, and yielded a pp/k and a light duty knife. The site may reflect a greater emphasis on hunting/butchering and less emphasis on tool production and maintenance than 23BE1008. The lithic scatter at 23BE1009 is small in extent but relatively dense despite recent disturbance by earth-moving activities and relic collecting. As noted earlier, the site is located at the juncture of several upland and valley environmental zones on a high terrace above the Osage River. The Barry site is interpreted as a

Table 3

Artifact Use Classes and Activity Indices by Site

Use Class	23BE1007	23BE1008	23BE1009	23BE1010
Projectile point/knife			x	x
Hafted knife				x
Generalized knife	x		x	x
Heavy duty knife		x	?	x
Utilized flake knife				x
Thick Preform	x		?	x
Aborted Preform			x	x
Chopper		x		x
Denticulate				x
Heavy duty scraper		x		x
Light duty, irregular scraper		x	x	x
Spokeshave scraper				x
Utilized flake scraper		x	x	x
Drill or perforator		x		x
Reamer			x	
Graver				x
Digging tool				x
Anvil				x
Mano				x
Pestle				x
Irregular working core				x
Blade core				x
Exhausted irregular core		x	x	x
Tested cobble				x
Primary decortication flake, non-utilized		x	x	x

Table 3 (continued)

Use Class	23BE1007	23BE1008	23BE1009	23BE1010
Secondary decortication flake, non-utilized	x	x	x	x
Interior flake, non-utilized	x	x	x	x
Biface thinning flake, non-utilized		x	x	x
Blade-like flake, non-utilized		x	x	x
Angular fragment, non-utilized		x	x	x
Thermally fractured rock		x		x
Pigment stone				x
Ceramic vessel				x
TOTAL	4	14	14	32
Activity Index	.1212	.4242	.4242	.9697

limited activity site in an optimum location for exploiting a great variety of natural resources; the site was intensively, perhaps seasonally, occupied.

The Lotterer site, 23BE1010, has a very high activity index (0.9697), a high artifact density, a midden, and a location on relatively high ground beside the Osage River. Both extractive and domestic activities are represented in the artifact assemblage. The site is interpreted as a multiple activity river-edge site which was intensively occupied possibly as a base settlement or even on a year-round basis.

Role of the Sites in Local Adaptive Systems

Despite their close proximity in the same general habitat, the main valley of the Osage River, the four sites in the project area are quite different from each other in terms of artifact density and content, the presence or absence of a midden, and specific topographic-environmental setting including site catchment area. Present evidence suggests that sites 23BE1007, 23BE1008, and 23BE1009 are limited-activity sites representing short-term occupations. They may represent resource extraction sites (cf. Klinger 1978) and, if so, their markedly different topographic-environmental settings and artifact content suggest that different resources were being exploited and different sets of activities were being performed at each site. The Lotterer site is interpreted as a multiple activity, intensively occupied site, perhaps a base settlement or year-round habitation site.

Although the cultural-temporal affiliations of the four sites are not entirely clear because of the limited artifact samples from the sites, some were occupied during the same general periods and possibly contemporaneously. The Lotterer and Barry sites have apparent Middle Woodland occupations, and the Lotterer site and, by inference, the Kowertz site have Late Woodland occupations. If, indeed, two or more sites of such markedly different functional types were occupied by the same cultural groups, they may prove to be functionally different but related components in prehistoric adaptive and sociocultural systems.

CHAPTER XIV

Local and Regional Cultural Contexts

The local and regional cultural contexts of the Below Truman sites will be very briefly discussed. More in-depth discussions should follow if these sites are more intensively and systematically sampled, particularly if a determination of National Register eligibility is sought.

Benton County and the central Osage River Valley have been extensively surveyed and intensively sampled by archaeologists, particularly in the Truman Reservoir area, and, at first glance, it may seem that a mere four sites just downstream from Truman Dam would be redundant and superfluous additions to the regional data base. It is true that the individual artifact types, site types, cultural periods, and topographic-environmental settings represented in the site inventory of the Below Truman Survey have been previously noted in the central Osage Valley many times over. However, the cultural resources found in the Below Truman survey area are distinctive in several ways:

1. Several functionally different site types have been found in a relatively restricted area. Some of the sites are roughly coterminous and they may represent two or more components in local adaptive and sociocultural systems.
2. Site density in the project area, a portion of the main valley of the Osage River, is unusually low (cf. Roper 1977a: Tables 10, 37). This phenomenon may have cultural-environmental implications.
3. The Kowertz site, 23BE1008, may represent a specific limited activity site type previously recognized by Roper (personal communication), which has relatively good stratigraphic context. Roper has previously found these sites in a surface context, and they are often essentially exhausted of cultural resources after the initial collection.
4. Only three open sites with buried Woodland horizons have been previously noted in the Truman Reservoir area. The Muller site in Benton County yielded Woodland and Late Archaic cultural material to depths of 3.2 meters (Vehik 1974, referred to in Iroquois Research Institute 1980:13). Site 23BE337, on the lower Pomme de Terre River, also has a buried Woodland horizon (Roper, personal communication), as does Phillips Spring, 23HI216, on the lower Pomme de Terre (Chomko 1978). The Lotterer site is the fourth known site of this type in the central Osage Valley.
5. One or more of the Below Truman sites may contain the remains of discrete or minimally mixed cultural horizons. Such sites are uncommon in any area and invariably have a high potential to contribute to the local and regional data bases.
6. The Middle Woodland components at the Lotterer and Barry sites are relatively uncommon phenomena in the central Osage Valley where open Middle Woodland sites are sparse (Roper 1977a:178-181).

CHAPTER XV

Assessment of Site Significance

Criteria of Significance and Assessment of Sites

As noted in the preceding chapter, the four sites in the project area possess a number of characteristics which individually or collectively give them a distinctive place in the archaeology of the central Osage Valley. The information already recovered from these sites has significantly contributed to the regional data base and to the investigation of local and regional research questions including those related to artifact typology, settlement patterns, and site function.

Although testing to determine site significance was specifically precluded by the project scope of work (Appendix I), the information recovered by the reconnaissance survey is sufficient to make assessments of potential eligibility for the National Register in three cases and an assessment of non-eligibility in the case of one site.

The Gaylord Pasture site, the Kowertz site, and the Lotterer site are assessed as potentially eligible for inclusion in the National Register of Historic Places. These assessments are made on the assumption that any cultural resource should be considered "potentially eligible" for National Register inclusion if the data available are not sufficient to support a determination of eligibility or noneligibility. The evidence from the reconnaissance suggests that the three sites in question fulfill the National Register criterion of integrity of location in that all appear to be primary deposits. Two sites, Lotterer and Kowertz, appear to have integrity of association as well, that is, the vertical and horizontal contexts of archaeological remains appear to be relatively undisturbed. The vertical context of archaeological remains at the Gaylord pasture site may have been entirely destroyed by the rooting of hogs, but there is a possibility that relatively undisturbed deposits remain at the site beneath alluvial and/or colluvial sediments--a possibility that would need to be verified by subsurface testing. Finally, the data generated by the surface collections at the three sites are insufficient to determine whether or not the sites have the potential to yield further information "important in prehistory" (36 CFR Part 60.6d). Therefore, these sites should be considered to be potentially eligible for the National Register, pending a program of testing to determine significance.

The integrity of association of the cultural deposits in the upper horizons at the Barry site has been totally destroyed by recent earth-moving activity, and the sampling universe of archaeological remains has been hopelessly biased by selective collecting by relic hunters. An intensive survey of the terrace edge and stream bank adjacent to the site revealed no evidence of buried cultural deposits. A total collection of the exposed archaeological materials remaining at the site in the wake of the collectors has been made by professional archaeologists and the environmental context of the site has been recorded. There is little likelihood that additional archaeological information could be obtained from the site, and its data-producing potential appears to have been exhausted. The site is assessed as ineligible for inclusion in the National Register of Historic Places.

Research Potential of the Sites

As noted above, the integrity of the Barry site appears to have been largely destroyed by recent land leveling and subsequent unsystematic collecting of artifacts, and the data-producing potential of the site appears to have been exhausted by this survey. The loss of the bulk of data from this site is extremely unfortunate because the high artifact density of the site and its location in a highly productive setting for procurement of wild food and other natural resources suggest that its potential to contribute to the archaeological record was extremely high prior to destruction.

The Gaylord pasture site has the potential to yield information on the functional role in local adaptive strategies of limited-activity, low-density sites on the margins of major river valleys. The research potential and significance of the site will largely depend on whether or not buried cultural horizons and/or subsurface features are present. Further investigation may also reveal the cultural identity of some of the site's occupants which would contribute to the study of past adaptive strategies in the region on a culture-specific level.

The Kowertz site may be a relatively well-preserved example of a limited activity, Late Woodland, river-edge site previously noted by Roper. The site's deposits are buried at an as yet undetermined depth. It is possible, although present data provide no verification, that the site may have resulted from the activities of a single cultural group (Late Woodland?). The site has a high potential to contribute to the investigation of research questions relating to culture chronology, site function, subsistence and settlement patterns, and the nature of local adaptive strategies and sociocultural systems.

The Lotterer site is quite unusual in its artifact content and stratigraphic context. Further investigation of the site could address a number of research questions including: the nature of Middle and Late Woodland occupation of the central Osage Valley (was it year-round or the result of short-term extractive activities by outside groups?); the refining of typological markers of Middle and Late Woodland cultures; the characteristic features of Middle and Late Woodland adaptive strategies and social organization; and the nature of persistence and change in local Woodland cultures.

CHAPTER XVI

Assessment of Project Impact

The four sites described above are within the direct impact zones of the project as planned. The direct impacts on these sites will include disturbance of artifact context by the excavation and moving of soil during full removal, by land leveling and excavation during the construction of levees and recreational facilities, and by creation of ruts by heavy equipment during construction. Another direct impact will be burial of some sites by the construction of levees. The Lotterer and Barry sites will be impacted by levee construction; the Kowertz site will be impacted by levee construction and, possibly, fill removal; and the Gaylord pasture site will be impacted by fill removal. With increased residential development and recreational use of the project area following completion of the project, a significant indirect impact will probably follow--increased collection of exposed artifacts and possibly nonprofessional excavation of sites by residents and visitors. The riverbank sites, Lotterer and Kowertz, are particularly vulnerable to pothunting.

If any of the sites assessed as potentially eligible for the National Register are ultimately determined to be eligible, the effect on them of the project, as planned, is very likely to be adverse. Since the Barry site has been assessed as ineligible for the National Register, it will not be adversely affected by the project as planned.

CHAPTER XVII

An Estimate of the Archaeological Resource Base of the Below Truman Project Area

As called for in the project scope of work (Appendix I) a reconnaissance of 100 percent of the project area was conducted. As a result of this reconnaissance four sites were located and recorded. However, as Roper's (1977a:221-227) experience in the Truman Reservoir area and many other studies demonstrate (e.g., House and Schiffer 1975:41), even intensive surface surveys conducted under favorable conditions are likely to miss some sites. Therefore, in order to accurately assess the impact of the project on archaeological resources in the project area and make appropriate management recommendations, an estimate of the probability that archaeological resources remain undiscovered in the project area is imperative.

In estimating the probability that archaeological sites remain undiscovered in an area which has been surveyed, the methods of the survey and the conditions under which it was conducted must be considered. This information is presented in the earlier chapter on the Field Reconnaissance. The survey consisted of a walkover of the entire project area and visual inspection of the ground surface in transects of 15 to 25 meters with minimal shovel testing. The major limitations to this type of survey were: 1) the ground surface was obscured by dense vegetation over much of the project area; 2) recent flooding is known to have buried at least 2 sites in the project area and they were discovered only because they were exposed by shoreline erosion; and 3) the visibility of some exposed surfaces was limited by the dryness of the soil.

These limitations were, at least in part, counteracted by: 1) the fact that all but two of the project/survey areas, tracts 3 and 4, are cut by bank erosion of the Osage River and/or are on the edge of a backswamp (Figure 5), and 2) a small number of shovel tests were excavated in unexposed areas back from the Osage River (Figure 5). Due to these factors which were favorable to the survey, there is a low probability that further and more intensive survey of the project area, using the methods described above, would result in the discovery of additional archaeological sites. However, the possibility must be considered that additional sites would be discovered, if other procedures, including deep subsurface testing were applied.

The density of archaeological sites located by the survey in the project area is relatively low. This area falls into Roper's (1977a:127-148) Stratum XIII, the lower Osage River. The average site density in this sampling unit in the Truman Reservoir Survey was 18.50 sites per square mile (Roper 1977a:226), whereas the site density in the Below Truman Dam project area was 5.12 sites per square mile.

Although the density of sites found in the Below Truman Dam project area could be interpreted to suggest that only one-third or fewer of the sites in the area were located by the survey, some mitigating factors should be considered. First the range of site densities in different transects of Stratum XIII is considerable--from 2.45 to 36.50 sites per square mile in transects of over 100 acres (cf. Roper 1977a:131). The site density in the Below Truman Dam project area is within the lower end of this range. Second, much of the land in the project area is in low-lying floodplain, much of which is presently in sloughs and backswamps. If these extensive backswamps and low-lying areas were present throughout aboriginal times, they would have been

uninhabitable or of marginal habitability. Therefore, the relatively low density of archaeological sites found in the project area may be due to local environmental limitations on prehistoric habitation rather than the presence of sites which could not be detected by the survey methods employed in the reconnaissance.

The four sites discovered in the project area are in settings which afford optimum habitability conditions. They are all in locations which provide permanent or seasonal access to a source of water, a catchment area which includes several different resource zones, and relatively high ground in and adjacent to the floodplain. Locations which superficially appear to be of comparable habitation potential exist in some of the Below Truman Dam project/survey areas, and the probability that undiscovered sites remain in these areas will be discussed on a tract-by-tract basis.

Tract 1--Site potential varies depending on the height of the terrace above the Osage River. The Lotterer and Barry sites were found in two of the highest locations in the tract. Similar locations may exist in the tract, but no evidence of other sites was found. Since the entire tract paralleled the shoreline of the Osage River, where surface visibility was good to excellent, and no evidence of other sites was found in a 100 percent survey of the shoreline, the probability is low that additional archaeological sites with significant amounts of cultural material are present in the tract. No evidence of the ferry landing shown on the 1839 map of the project area was found. This site has probably been destroyed by erosion and bridge construction.

Tract 2--Surface visibility along streets and backswamps in this tract was good (Figure 5), and it should have been sufficient to locate any sites with significant amounts of cultural material. The probability is low that buried sites are present in this tract, and it is unlikely that undiscovered sites of potential significance are present.

Tract 3--This tract is in a topographically undifferentiated area on a terrace edge. Shovel tests indicate that the probability that a potentially significant site is present in this tract is quite low.

Tract 4--This tract is in a more favorable habitation setting than tract 3. A light lithic scatter, the Gaylord pasture site, was found under conditions of very good surface visibility (75%). Portions of this site may be buried by sediments from the slope above it.

Tract 5--This location is on a steep slope and it has a very low habitation potential which was confirmed by the negative results of the survey.

Tract 6--This low-lying portion of the floodplain appears to have a relatively low habitation potential. Survey of the extensive river and backswamp shorelines, which had 75 percent surface visibility, and of scattered exposed areas support a prediction that there is little likelihood that any archaeological sites are present but as yet undiscovered in this tract.

Tract 7--Along with tract 1, this area has the highest habitation potential in the project area. Therefore, it was somewhat surprising to find only one site in this tract despite the fact that the tract is completely surrounded by exposed riverbank and backswamp shoreline (Figure 5). The probability that additional undiscovered sites exist in this project/survey area has been significantly reduced by the survey; however, this tract is broader than tract 1 and until deep subsurface testing is conducted, the possibility that additional buried sites are present should be entertained.

Tract 8--Visibility was generally poor in this area despite the presence of a backswamp shoreline and a dirt road. Although the potential for buried sites to exist in this tract has been reduced by the survey, it should not be rejected without subsurface testing.

CHAPTER XVIII

Recommendations

An archaeological reconnaissance has been conducted in eight individual project/survey tracts below Truman Dam (Figure 5). In four of these areas, tracts 2, 3, 5, and 6, no potentially significant archaeological sites are present (see preceding chapter). Therefore, the project as planned is assessed as having no impact on significant or potentially significant archaeological resources in tracts 2, 3, 5, and 6, and it is recommended that the project be issued clearance to proceed as planned in these tracts.

Two archaeological sites were found in tract 1. The Barry site, 23BE1009, has been assessed as ineligible for inclusion in the National Register, while the Lotterer site, 23BE1010, has been assessed as potentially eligible for the National Register. Based on the survey of the riverbank which parallels this tract, the probability is low that undiscovered sites are present in the tract. It is recommended that the Lotterer site, which is in the direct impact area of proposed levee construction, be avoided by the project. If this is not possible, a Phase II program of subsurface testing is recommended to determine the significance of the site and the potential effect of the project on it. In addition to shovel excavation of test units and profiling of the river bank at the site, it is recommended that recent sterile alluvial overburden be removed from selected areas of the site with a backhoe to facilitate excavation of the test units and determine the extent of the archaeological deposits. Remains of the 1839 ferry landing appear to have been destroyed, and no further investigation or management consideration of this site is recommended.

One archaeological site, the Gaylord pasture site, 23BE1007, was found in tract 4. This site has been assessed as potentially eligible for the National Register, and it is recommended that the site be avoided by the project. If this is not possible, a Phase II program of testing is recommended. This program should include subsurface testing to determine if undisturbed cultural horizons are present at the site and assess the site's archaeological content.

One site, the Kowertz site, 23BE1008, was found in tract 7. This site is assessed as potentially eligible for the National Register, and it is recommended that the site be avoided by the project. If this is not possible, test excavations similar to those recommended for the Lotterer site are recommended. Depending on the depth of the overburden at the site, it may be useful to use a backhoe in the early stages of excavation. Since there is some possibility that undiscovered sites are present in this tract, a program of systematic deep testing with a backhoe or large diameter soil auger is recommended.

No archaeological sites were found in tract 8. However, the tract includes a valley edge terrace with a backswamp in front, a setting somewhat like that in tract 3, where the Gaylord pasture site was found under far better visibility conditions than in tract 8. Since the surface survey in tract 8 was not sufficient to rule out the possibility that archaeological sites may be present, a program of systematic subsurface testing, to include the excavation of shovel tests and possibly test units, auger tests and/or backhoe trenches, is recommended.

In summary, it is recommended that the project be issued clearance to proceed as planned in tracts 2, 3, 5, and 6. Systematic subsurface testing

to determine if any buried sites were not detected by the reconnaissance is recommended for tracts 7 and 8. Finally sites potentially eligible for inclusion in the National Register of Historic Places were found in tracts 1, 4, and 7. It is recommended that these sites be avoided by the project or that test excavations be conducted to determine their significance and the potential effect of the project on these sites. If any or all of these sites are determined to be eligible for the National Register, avoidance, preservation, or mitigation through data recovery are strongly recommended.

Although clearance for the project to proceed has been recommended for tracts 2, 3, 5, and 6, the possibility that undetected archaeological sites remain on these properties cannot be completely rejected. If archaeological resources are found on these properties prior to or during project activities, it is recommended that the project be temporarily delayed until the U.S. Army Corps of Engineers and the Missouri State Historic Preservation Officer are notified and the significance of the archaeological resources and the potential effect of the project on them are determined.

A final recommendation concerns the fact that artifacts are presently being eroded from their primary depositional context at the Kowertz and Lotterer sites. Periodic shoreline inspections should be conducted at these sites by a professional archaeologist to salvage dislocated cultural materials and assess the impact of the erosion. It is strongly recommended that steps be taken to prevent further erosion and loss of valuable archaeological data at these sites.

REFERENCES CITED

- Ahler, Stanley A.
 - 1971 Projectile Point Form and Function at Rodgers Shelter, Missouri. Missouri Archaeological Society, Research Series No. 8.
 - 1976 Sedimentary Processes at Rodgers Shelter. In Prehistoric Man and His Environments, pp. 123-139. New York: Academic Press.
- Ahler, Stanley A. and R. Bruce McMillan
 - 1976 Material Culture at Rodgers Shelter: A Reflection of Past Human Activities. In Prehistoric Man and His Environments, A Case Study in the Ozark Highland, pp. 163-199. W. Raymond Wood and R. Bruce McMillan, editors. New York: Academic Press.
- Allgood, Ferris P. and Ival D. Persinger
 - 1979 Missouri general soil map and soil association descriptions. U.S. Department of Agriculture, Soil Conservation Service in cooperation with Missouri Agricultural Experiment Station, Columbia, Missouri.
- Anonymous
 - 1904 Atlas of Benton County. On file at the Benton County Courthouse, Warsaw, Missouri.
- Baerreis, David A. and Joan E. Freeman
 - 1960 A report on a bluff shelter in northeastern Oklahoma (D1-47). Archives of Archaeology, No. 1.
- Binford, Lewis R.
 - 1964 A consideration of archaeological research design. American Antiquity, 29:425-441.
- Bretz, J. Harlan
 - 1965 Geomorphic history of the Ozarks of Missouri. Missouri Geological Survey and Water Resources, Second Series, 41.
- Calabrese, F. A., Rolland E. Pangborn, and Robert J. Young
 - 1968 Dryocopus Village, a second non-ceramic site in the Stockton Reservoir. Report submitted to the National Park Service, Midwest Region by the University of Missouri under Contract No. 14-10-2: 920-927.
- Chapman, Carl H.
 - 1954 Preliminary salvage archaeology in the Pomme de Terre Reservoir area, Missouri. The Missouri Archaeologist, 16(3-4).
 - 1965a Halleys Bluff, 23VE2. In Preliminary archaeological investigations in the Kaysinger Bluff Reservoir area, Missouri, Carl H. Chapman, editor. Report submitted to the National Park Service on Contracts 14-10-232-374 and 14-10-0232-589. Midwest Research Center, Lincoln, Nebraska.
 - 1965b The Hayes Site, 23VE4. In Preliminary archaeological investigations in the Kaysinger Bluff Reservoir area, Missouri, edited by Carl H. Chapman. Report to the National Park Service on Contracts 14-10-232-374 and 14-10-0232-589. Midwest Research Center, Lincoln, Nebraska.

- Chapman, Carl H. (continued)
- 1973 Some comments about the distribution of three hundred fluted points in Missouri. Missouri Archaeological Society Newsletter 275.
 - 1975 The Archaeology of Missouri, I. Columbia: University of Missouri Press.
 - 1980 The Archaeology of Missouri, II. Columbia: University of Missouri Press.
- Chomko, Stephen A.
- 1978 Phillips Spring, 23HI216: a multicomponent site in the western Missouri Ozarks. Plains Anthropologist, 23:235-254.
- Chomko, Stephen A. and Gary W. Crawford
- 1978 Plant husbandry in prehistoric eastern North America: new evidence for its development. American Antiquity, 43:405-408.
- Collins, Charles D., Andris A. Danielsons, and James A. Donohue
- 1977 The downstream Stockton study investigations at the Montgomery site, 23CE261. American Archaeology Division, Department of Anthropology, University of Missouri-Columbia.
- Cooley, Robert E. and Betty Jane Turner
- 1979 A Literature Review of the Prehistoric and Historic Cultural Resources for the KAMO Electric Cooperative Inc., 161 kv Transmission Line Transect Across Sections in Benton County, Missouri: 1979. Center for Archaeological Research Report No. 239.
- Crook, W.W., Jr., and R.K. Harris
- 1957 Hearths and artifacts of early man near Lewisville, Texas, and associated faunal materials. Bulletin of the Texas Archaeological Society 28:7-97.
- Douthit, Mary Lee
- 1980 Final Report on Archaeological Investigations of Sites Along the James River Interceptor Sewer, City of Springfield, Greene County, Missouri: 1979. Center for Archaeological Research, Report No. 133. In progress.
- Goodspeed Publishing Company
- 1889 History of Cole, Moniteau, Morgan, Benton, Miller, Maries, and Osage Counties, Missouri. Chicago: Goodspeed Publishing Company.
- Goodyear, Albert C., L. Mark Raab, and Timothy C. Klinger
- 1978 The status of archaeological research design in cultural resource management. American Antiquity, 43(2):159-173.
- Haynes, C. Vance
- 1976 Lower Quaternary Geology of the Lower Pomme de Terre Valley. In Prehistoric Man and His Environments, A Case Study in the Ozark Highland, pp. 63-78, W. Raymond Wood and R. Bruce McMillan. editors. New York: Academic Press.
 - 1977 Report on the geochronological investigations in the Harry S. Truman Reservoir area, Benton and Hickory counties, Missouri. In Cultural Resources Survey, Harry S. Truman Dam and Reservoir Project, Vol. 10: F.B. King, and D.L. Johnson, pp. 23-32. Report to the U.S. Army Corps of Engineers, Kansas City District. American Archaeology Division, University of Missouri-Columbia. (Published 1983)

House, John H.

- 1975 A functional typology for Cache River Project surface collections. In The Cache River archeological project: An experiment in contract archeology, pp. 55-73, Michael B. Schiffer and John H. House, assemblers. Arkansas Archeological Survey, Publications in Archeology, Research Series No. 8.

House, John H. and Michael B. Schiffer

- 1975 Archaeological survey in the Cache River Basin. In The Cache River archeological project: An experiment in contract archeology, pp. 37-54. Michael B. Schiffer and John H. House, assemblers. Arkansas Archeological Survey, Publications in Archeology, Research Series No. 8.

Iroquois Research Institute

- 1980 Archaeological reconnaissance in the Harry S. Truman Dam and Reservoir: 50 year flood easement lands, Osage River Basin, Missouri. Report to the U.S. Army Corps of Engineers, Kansas City District, Contract No. DACW41-79-C-0073.

Joyer, Janet E. and Donna C. Roper

- n.d. Archaic Adaptations in the Central Osage River Basin: A Preliminary Assessment. Manuscript on file at the Center for Archaeological Research.

Kay, Marvin, editor

- 1978a Holocene adaptations within the Lower Pomme de Terre Valley, Missouri. Final report to the U.S. Army Corps of Engineers, Kansas City District. Illinois State Museum Society, Springfield. (Pub 1982)
1978b Rodgers Shelter: An example of deep site sampling. In Holocene adaptations within the Lower Pomme de Terre Valley, Missouri. Final report to the U.S. Army, Corps of Engineers, Kansas City District. Illinois State Museum Society, Springfield. (Published 1982)
1978c Stylistic study of chipped stone points. In Holocene adaptations within the Pomme de Terre Valley, Missouri. Marvin Kay, editor. Final report to the U.S. Army, Corps of Engineers, Kansas City District. Illinois State Museum Society, Springfield. (Published 1982)

Keller, Charles M.

- 1965 Preliminary archaeological reconnaissance and testing. In Preliminary archaeological investigations in the Kaysinger Bluff Reservoir area, Missouri, Carl H. Chapman, editor. Report to the National Park Service on Contracts 14-10-232-374 and 14-10-0232-589. Midwest Research Center, Lincoln, Nebraska.

King, Frances B.

- 1976 Appendix A, Potential Food Plants of the Western Missouri Ozarks. In Prehistoric Man and His Environments, A Case Study in the Ozark Highland. W. Raymond Wood and R. Bruce McMillan, editors, pp. 63-80. New York: Academic Press.
1978 Vegetation reconstruction and plant resource prediction. In Holocene adaptations within the Lower Pomme de Terre Valley, Missouri, Marvin Kay, editor. Final report to the U.S. Army, Corps of Engineers, Kansas City. Illinois State Museum Society, Springfield. (Published 1982)

- King, Frances B. and R. Bruce McMillan
 1975 Plant remains from a Woodland storage pit, Boney Spring, Missouri. *Plains Anthropologist*, 20(68).
- King, James E. and Everett H. Lindsay
 1976 Late Quaternary Biotic Records from Spring Deposits in Western Missouri. *In Prehistoric Man and His Environments, A Case Study in the Ozark Highland*, pp. 63-78. Edited by W. Raymond Wood and R. Bruce McMillan. New York: Academic Press.
- Klinger, Timothy C.
 1978 Lowland environmental variability and prehistoric settlement behavior in the lower Mississippi Valley. *Midcontinental Journal of Archaeology*, 3(2):285-333.
- Koch, Alfred K.
 1857 Mastodon remains in the state of Missouri, together with evidences of the existence of man contemporaneously with the mastodon. *Transactions of the Academy of Science of St. Louis*, 1:61-64.
- Lay, James H.
 1876 History of Benton County, Missouri. Reprinted in Warsaw, Missouri: The Printery.
- Linderer, Nanette M.
 1976 Architectural survey: lower Pomme de Terre. *In Cultural Resources Survey, Harry S. Truman Dam and Reservoir Project: Lower Pomme de Terre Arm*, pp. 100-129. W. Raymond Wood, principal investigator.
- Lynott, Mark J.
 1980 The dynamics of significance: an example from Central Texas. *American Antiquity*, 45(1):117-120.
- McMillan, R. Bruce
 1966 Archaeological investigations in the Stockton Reservoir area, southwestern Missouri: 1962-1964, Part II. Report to the National Park Service, Midwest Region.
 1976a The Pomme de Terre Study Locality: Its Setting. *In Prehistoric Man and His Environments, A Case Study in the Ozark Highland*, pp. 13-44. Edited by W. Raymond Wood and R. Bruce McMillan. New York: Academic Press.
 1976b The Dynamics of Cultural and Environmental Change at Rodgers Shelter, Missouri. *In Prehistoric Man and His Environments, A Case Study in the Ozark Highland*, pp. 211-232, edited by W. Raymond Wood and R. Bruce McMillan. New York: Academic Press.
 1976c Man and Mastodon: A Review of Koch's 1840 Pomme de Terre Expeditions. *In Prehistoric Man and His Environments, A Case Study in the Ozark Highland*, pp. 81-96, edited by W. Raymond Wood and R. Bruce McMillan. New York: Academic Press.
- McNett, Charles W., Jr., Sydne B. Marshall, and Ellis E. McDowell
 1975 Second Season of the Upper Delaware Valley Early Man Project. Department of Anthropology, The American University, Washington, D.C. Report to the National Geographic Society and the National Science Foundation.

Meyer, Duane

- 1970 The Heritage of Missouri: A History. Hazelwood: State Publishing Company, Inc.

Pangborn, Rolland E., H. Trawick Ward, and W. Raymond Wood

- 1971 Flycatcher Village: a non-pottery site in the Stockton Reservoir, Missouri. Plains Anthropologist, 16(51):60-73.

Perino, Gregory

- 1971 Guide to the Identification of Certain American Indian Projectile Points. Oklahoma Anthropological Society, Special Bulletin No. 4.

Piontkowski, Michael R.

- 1977 Preliminary archaeological investigations at two Early Archaic sites: the Wolf Creek and Hand sites. In Cultural Resources Survey, Harry S. Truman Dam and Reservoir Project, Vol. 9: preliminary studies of Early and Middle Archaic components, pp. 1-57. Report to the U.S. Army Corps of Engineers, Kansas City District. American Archaeology Division, University of Missouri, Columbia. (Pub 198

Price, Cynthia R.

- 1978 An Assessment of the Significance of Selected Archaeological Sites in the Narrows and Riverton Study Areas, Mark Twain National Forest, Oregon County, Missouri: 1978. Center for Archaeological Research, Report No. 96.
- 1979 An Assessment of Prehistoric Archaeological Site 23OR61 and a Cultural Resources Survey at Riverton in Mark Twain National Forest, Oregon County, Missouri: 1978. Center for Archaeological Research, Report No. 203.
- 1980a Archaeological Investigations at Prehistoric Sites 23OR42 (Riverton), 23OR60 (Turtle Island Spring), and 23OR59 (Rush Creek Camp) in the Eleven Point Valley, Oregon County, Missouri: 1979. Center for Archaeological Research, Report No. 252.
- 1980b An Assessment of the Function of the Prehistoric Sites. In Changing Settlement Systems in the Fourche Creek Watershed in the Ozark Border Region of Southeast Missouri and Northeast Arkansas, pp. 550-589, James E. Price and Cynthia R. Price, editors. Center for Archaeological Research, Report No. 251.

Price, James E., Cynthia R. Price, John Cottier, Suzanne Harris, and John House

- 1975 An assessment of the cultural resources of the Little Black Watershed. Report prepared for the U.S. Department of Agriculture, Soil Conservation Service, University of Missouri-Columbia.

Price, James E. and Cynthia R. Price, editors

- 1980 Changing Settlement Systems in the Fourche Creek Watershed in the Ozark Border Region of Southeast Missouri and Northeast Arkansas: 1980. Center for Archaeological Research, Report No. 251. Draft copy submitted to U.S. Department of Agriculture, Soil Conservation Service, administered by the Interagency Archaeological Services-Denver, Contract No. C35001.(79).

Purrington, Burton L.

- 1971 The Prehistory of Delaware County, Oklahoma: Cultural Continuity and Change on the Western Ozark Periphery. Ph.D. dissertation (Anthropology). 2 vols. University of Wisconsin-Madison.

Raab, L. Mark and Timothy C. Klinger

- 1977 A critical appraisal of "significance" in contract archaeology. American Antiquity, 42(4):629-634.

Reagan, Michael, editor

- 1979 Harry S. Truman Archaeological Project, lithic laboratory procedures manual. American Archaeology Division, University of Missouri-Columbia.

Reagan, Michael J., Ralph M. Rowlett, Ervan G. Garrison, Wakefield Dort, Jr., Vaughn M. Bryant, Jr., and Chris J. Johannsen

- 1978 Flake tools stratified below Paleo-Indian artifacts. Science, 200:1272-1275.

Roper, Donna C.

- 1975 Cultural resources survey, Harry S. Truman Dam and Reservoir project: the archaeological survey. American Archaeology Division, University of Missouri-Columbia. Part 1: Prior surveys; Part 2: Survey of borrow areas and relocations.
- 1977a Cultural Resources Survey, Harry S. Truman Dam and Reservoir, Vol. 4: the archaeological survey. Final report to the U.S. Army Corps of Engineers, Kansas City District. American Archaeology Division, University of Missouri-Columbia. (Published 1983)
- 1977b Archeological Resources. In The Downstream Stockton Study: The Cultural Resources Survey. U.S. Army Corps of Engineers, Kansas City District, Contract No. DACW41-76-M-1059. Division of American Archaeology, University of Missouri-Columbia.
- 1978 Settlement-subsistence systems in the Truman Reservoir area. Paper presented at the Society for American Archaeology, 43rd Annual Meeting, May 4-6, 1978, Tucson, Arizona.
- 1979 The Woodland period in the Ozarks: The concept, its history, and its place in prehistory. Paper presented at the 37th Plains Conference, Nov. 1-3, 1979, Kansas City, Missouri.

Roper, Donna C. and W. Raymond Wood

- 1976 Research design. In Cultural Resources Survey, Harry S. Truman Dam and Reservoir Project: Lower Pomme de Terre Arm, pp. 41-48. Report to the U.S. Army Corps of Engineers, Kansas City District. American Archaeology Division, University of Missouri-Columbia.

Sauer, Carl O.

- 1920 The Geography of the Ozark Highland of Missouri. Chicago: University of Chicago Press.

Sharrock, Floyd W. and Donald K. Grayson

- 1979 Significance in contract archaeology. American Antiquity, 44: 327-328.

- Stevens, Walter B.
1915 Missouri, the Center State, 1821-1915. St. Louis: S.J. Clarke Publishing Company.
- Suhm, Dee Ann, Alex D. Krieger, and Edward B. Jelks
1954 An introductory handbook of Texas Archaeology. Bulletin of the Texas Archaeological Society, 25.
- Synhorst, Curtis H.
1976 Introduction to Pomme de Terre historical sites. Cultural Resources Survey, Harry S. Truman Dam and Reservoir Project: Lower Pomme de Terre River Arm, Final Report. Unpublished manuscript, U.S. Army Corps of Engineers, Kansas City District.
- U.S. Department of Commerce
1978 Climate of Missouri. Climatology of the United States, No. 60. Ashville, Maryland.
- Vehik, Rain
1974 Archaeological investigations in the Harry S. Truman Reservoir area: 1970. Report submitted to the National Park Service under Contract No. 14-10-2:921-191. Midwest Research Center, Lincoln, Nebraska.
- Ward, H. Trawick
1968 The Shady Grove site, a village site in the Stockton Reservoir, Report to the National Park Service, Midwest Region, Contract No. 14-10-2:920-7. University of Missouri-Columbia.
- Ward, R.A., T. L. Thompson, C. V. Haynes, F. B. King, and D. L. Johnson
1977 Cultural resources survey, Harry S. Truman Dam and Reservoir Project, Volume 10: Environmental study papers. Report to the U.S. Army Corps of Engineers, Kansas City District. American Archaeology Division, University of Missouri-Columbia. (Pub 1983)
- Weichman, Michael S.
n.d. Watersheds in the State of Missouri, Office of Historic Preservation, Missouri Department of Natural Resources.
- White, Anta M.
1963 Analytic description of the chipped-stone industry from Snyders site, Calhoun County, Illinois. In Miscellaneous Studies in Typology and Classification, Anthropological Papers, Museum of Anthropology, University of Michigan, No. 19.
- White, Lydia A. and Mahlon K. White
1978 Warsaw, Missouri: Scenes from an Ozark Rivertown. Warsaw, Missouri: The Printery.
- Winters, Howard D.
1969 The Riverton Culture. Illinois State Museum Reports of Investigations, No. 13.

Wood, W. Raymond

- 1961 The Pomme de Terre Reservoir in western Missouri. Prehistory. The Missouri Archaeologist, 23.
- 1967 The Fristoe Burial Complex of southwestern Missouri. The Missouri Archaeologist, 29.
- 1968 Mississippian hunting and butchering patterns: Bone from the Vista Shelter, 23SR20, Missouri. American Antiquity, 33(2).
- 1976 Archaeological investigations at the Pomme de Terre Springs. In Prehistoric Man and His Environments: A Case Study in the Ozark Highland, W. Raymond Wood and R. Bruce McMillan, editors, pp. 97-107. New York: Academic Press, Inc.

Wood, W. Raymond, and R. Bruce McMillan, editors

- 1976 Prehistoric Man and His Environments: A Case Study in the Ozark Highland. New York: Academic Press, Inc.

Zawacki, April A., and Glenn Hausfater

- 1969 Early Vegetation of the Lower Illinois Valley. Illinois State Museum, Reports of Investigations, No. 17. Illinois Valley Archaeological Program, Research Papers, I. State of Illinois, Springfield, Illinois.

It is the policy of Southwest Missouri State University not to discriminate on the basis of race, color, age, sex, handicap, religion, or national origin in its educational programs, financial aids, activities, admissions, or employment policies.

Appendix I-

Inventory of Descriptive/Use Categories of
Artifacts from 1980 Below Truman Reconnaissance

	Projectile point/knife	Hatted knife	Biface							Denticulate	Thick, steeply beveled end scraper	Irregular flake scraper	Spokeshave scraper	Utilized flake scraper	Scraper fragment	Chopper	Perforator, reworked pp/k	Perforator, unprepared flake	Digging tool? (pol- ished biface)	Irregular flake, scraper/graver	Irregular flake, knife/scraper	Irregular flake, scraper/reamer	Utilized flake, knife/scraper	Tested cobble	Blade core?	Working core
23BE1007 General Sur- face		1	Thin, edge retouch (knife)	Thick, edge retouch (knife)	Thick, no edge re- touch (preform)	Thin fragment (knife or pp/k)	Thick fragment (knife or preform)	Indeterminate fragment	Aborted Preform									1								
23BE1008 General Sur- face																										
0-10 m. S.*														1												
10-20 m. S.*														1												
20-30 m. S.*														1												
30-40 m. S.*														3												
40-50 m. S.*														1												
50-60 m. S.*																1										
60-70 m. S.*														1												
70-80 m. S.*																										
80-90 m. S.*														2												
90-120 m. S.*											1	2		4	1											
120-133 m. S.*											2	3		13	2			1								
Total			1	1								4		7												
23BE1009 General Sur- face	1	1					1		1																	

*surface

Appendix I: (continued)

	Flake						Exhausted core	Angular fragment	Mano	Pestle	Shaped cobble fragment	Anvil	Ground hematite	Fossilized crinoid stem	Fossiliferous cobble	Ceramics--limestone-tempered, plain	Thermally-fractured stone	Total prehistoric artifacts	Historic ceramics
	Primary decoration	Secondary decoration	Blade-like	Biface thinning	Interior														
23BE1007 General Surface		3			1													6	
23BE1008 General Surface	2	1	2	2	15	1												24	
0-10 m. S.*		2	2		8	1												11	
10-20 m. S.*		2	4		4													12	
20-30 m. S.*			2	1	2	2												8	
30-40 m. S.*			3		8												2	18	
40-50 m. S.*					2													2	
50-60 m. S.*																		1	
60-70 m. S.*																		1	
70-80 m. S.*					1													1	
80-90 m. S.*	1	3			3													9	
90-120 m. S.*	1	3	1	2	14													29	1
120-133 m. S.*					2													3	
Total	2	5	19	1	5	57	6										2	119	1
23BE1009 General Surface	2	1	16	5	2	25	4											71	1

*surface

Appendix I (continued)

	Projectile point/knife	Biface							Denticulate	Thick, steeply beveled end scraper	Irregular flake scraper	Spokeshave scraper	Utilized flake scraper	Scraper fragment	Chopper	Perforator, reworked pp/k	Perforator, unprepared flake	Digging tool? (polished biface)	Irregular flake, scraper/graver	Irregular flake, knife/scraper	Irregular flake, scraper/reamer	Utilized flake, knife/scraper	Tested cobble	Blade core?	Working core	
		Thin, edge retouch (knife)	Thick, edge retouch (knife)	Thick, no edge retouch (preform)	Thin fragment (knife or pp/k)	Thick fragment (knife or preform)	Indeterminate fragment	Very thick biface, extensive hinge fractures (ab. pref.)																		
23BE1010										1			1													
General Sur-face													1													
20-10 m. N. Surface		1		1									1													
10-0 m. N. Surface						1							1													
0-10 m. S. Surface	1	1			1					1			1							1			1		1	
10-20 m. S. Surface	2			1				2	4	1			1		15			1	1						1	
20-30 m. S. Surface	2	1							1			2		1	4		1					1			4	
30-40 m. S. Surface			1						3					3										1	1	
40-50 m. S. Surface	1		1						1					1	1										2	
50-60 m. S. Surface																										
Total	5	1	3	2	2		2	2	9	1	4	1	1	26	1	1	1	1	1	1	1	1	1	1	1	1

Appendix I (continued)

	Exhausted core	Flake					Angular fragment	Mano	Pestle	Shaped cobble fragment	Anvil	Ground hematite	Fossilized crinoid stem	Fossiliferous cobble	Ceramics--limestone-tempered, plain	Thermally-fractured stone	Total prehistoric artifacts	Historic ceramics
		Primary decoration	Secondary decoration	Blade-like	Blade thinning	Interior												
23BE1010 General Surface	1		1		2	4											10	
20-10 m. N. Surface			1			4											8	
10-0 m. N. Surface		4			1	13	1									1	22	
0-10 m. S. Surface			5	1	1	17											32	
10-20 m. S. Surface	2	4	17	4	11	60	12	1	1	1	2	1				12	157	2
20-30 m. S. Surface	3	5	29	9	11	97	6	1	1	1	1		1			23	203	
30-40 m. S. Surface	3		7	2	5	27	2	1								1	57	
40-50 m. S. Surface	1	3	9	4	4	39										10	77	
50-60 m. S. Surface			1	2	3	6	1										13	
Total	10	16	70	22	38	267	21	2	1	1	1	3	1	1		47	578	2

APPENDIX II.

Excavated Archaeological Material from 23BE1010

General Area

ca. 2 m. b.s., Stratum III?	Limestone tempered, plain sherd
<u>10-0 m. N.</u>	
1.6-1.8 m. b.s., Stratum III	Exhausted core Interior flake
<u>20-30 m. S.</u>	
ca. 1.5 m. b.s., Stratum II	Secondary decortication flake
ca. 2.0 m. b.s., Stratum III	Pp/k, corner-notched, generalized Woodland type Secondary decortication flake Interior flakes (2)
<u>40-50 m. S.</u>	
1.4-1.6 m. b.s., Stratum III	Interior flake
Base of bank, 2.2 m. b.s. (possibly wash)	Aborted preform Thick, steeply beveled end scraper Interior flakes (2)
Stratum I - A horizon, c. 0.0-0.3m. b.s., dark-gray-brown organic horizon.	
Stratum II - Light tan horizon, c. 0.3-1.5m. b.s.	
Stratum III - Dark gray-brown midden zone, c. 1.5-2.0m. b.s.	
Stratum IV - Light tan horizon c. 2.0-2.8m. b.s.	
Stratum V - Gleyed clay horizon.	

Appendix III

Types of Flakes Utilized and Retouched as Scrapers

	Primary decortication	Secondary decortication	Blade-like	Biface thinning	Interior	Total
<u>23BE1008</u>						
Irregular flake scraper	1				2	3
Utilized flake scraper*		2	1		11	14
Non-utilized flake	5	19	1	5	57	87
Total	6	21	2	5	70	104
<u>23BE1009</u>						
Irregular flake scraper		2			2	4
Utilized flake scraper		6			1	7
Non-utilized flake	1	16	5	2	25	49
Total	1	24	5	2	28	60
<u>23BE1010</u>						
Irregular flake scraper						
Utilized flake scraper*	2	7	2	2	14	27
Non-utilized flake	16	70	22	38	267	413
Total	18	77	24	40	281	440

*includes 1 combination tool

APPENDIX IV

Glossary

Archaeological Resource: "Those nonrenewable cultural resources that generally are revealed in particular locations referred to as archaeological sites; however, sites must be viewed not only as independent entities but integrated into broader cultural manifestations." (From the working draft of the State Masterplan of the Missouri Association of Professional Archaeologists, March 6, 1980 (MAPA), p. 5.

Archaeological Site: "Any locus of past human activity. Sites include, but are not limited to occupation loci, work areas, evidence of farming or hunting and gathering, burials and other funerary remains, artifacts, and structures of all types." (MAPA, p. 5) In this report any spatially discrete location at which one or more artifacts or features have been found in apparently primary depositional context is recorded as an archaeological site.

Catchment: The geographical area from which occupants of a specific site extracted resources.

Cultural Horizon: In this report this term is the equivalent of McMillan's (1976:211) culture/time stratigraphic units which "are chronologically discrete horizons that have been assigned absolute temporal limits and, based on subsistence data and activity indicators, contain levels that display some degree of cultural homogeneity when compared with units above or below them."

Cultural Resources: "Districts, sites, structures, and objects and evidence of some importance to a culture, a subculture, or a community for scientific traditional, religious, or other reasons. These resources and relevant environmental data are important for describing and reconstructing past lifeways, for interpreting human behavior, and for predicting future courses of human development." (Airlie House Report, p. 110, quoted in MAPA, p. 4).

Ecotone: In a general sense, a transitional area between two or more major environmental zones containing elements of each zone.

Function: The role of an artifact attribute, artifact, activity-set, or site in the total sociocultural system in which it occurs.

Potential Site Significance: A classification used whenever the information recovered from a site is not sufficient to determine whether or not the site is eligible for inclusion in the National Register of Historic Places.

Rot Lid Spalling: Thermally induced removal of circular to ovoid flakes with hemispherical to hemiconical cross-sections from stone.

Primary Depositional Context: The location and setting in which an artifact or other culturally relevant item was originally deposited.

Site Significance: A site is significant when it is included in or has been determined to be eligible for inclusion in the National Register of Historic Places.

Use: The human actions in which an artifact attribute, artifact, feature, activity-set, or site is involved, e.g., slicing meat, primary flaking of stone tools, cooking, etc.